

# The **IRON AGE**

September 25, 1958

A Chilton Publication

The National Metalworking Weekly



American Brake Shoe's Given:

**How to Develop  
Your Executive  
Abilities P. 59**

**Will Steel Labor  
Get Its Way in 1959? – P. 45**

**Ways to Plan For  
Better Plant Layout – P. 85**

**Digest of the Week – P. 2-3**

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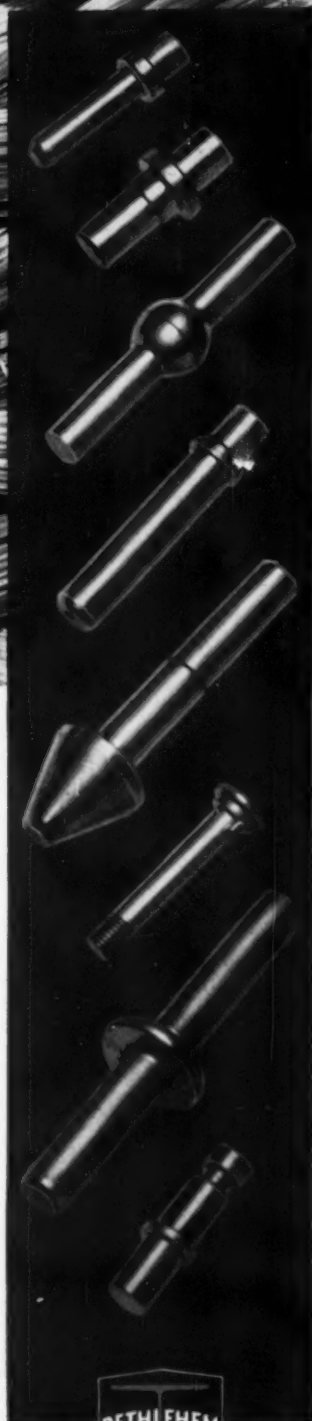
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**THE IRON AGE**  
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# The IRON AGE

Septmeber 25, 1958—Vol. 182, No. 13

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### NEWS ARTICLES

#### STEEL LABOR

**McDonald in the Saddle**—David J. McDonald is firmly established as top man in the steel union. He



scored a handy victory over rebel forces at the union's convention in Atlantic City. Look for tough bargaining in '59. P. 45

#### SALES OUTLOOK FOR '59

**Gains for Most**—Many industries will chalk up sales gains next year, speakers at marketing conference predict. There'll be limited gains for some industries, larger ones for others. Steel production may increase by 25 pct. P. 47

#### SPACE AGE

**Its Industrial Impact**—Technological changes brought on by the space age will affect every industry. There will be greater demand for research and development, less emphasis on production. P. 48

#### CAPITOL LINEUP

**Democrat Majority**—Both parties

# Metalworking



**SELF-ADVANCEMENT:** William B. Given, Jr., chairman of the board, American Brake Shoe Co., lays down a list of rules for the young executive to follow to help himself in his climb up the executive ladder of his company. P. 59

figure the Democrats will take about 20 Republican House seats in November. P. 67

## GAGING PROBLEM

**Measuring a Millionth**—How to check production pieces to a few millionths of an inch is a headache to missile and rocket men. Various measuring techniques produce different answers. P. 71

## FEATURE ARTICLES

### PLANT LAYOUT

**A Way to Cut Costs**—Plant layout can spell the difference between a profitable operation and a costly one. The big factors are machine arrangement and material flow. A checklist of danger signs shows how to correct bottlenecks. Schematic drawings aid in planning for better layout. P. 85

### FASTENERS

**Locking Methods**—Bolts, screws and nuts have a way of loosening. Fortunately, there's a wide range of locking methods. Whether a method is reusable is the main classification. A secondary classification is the amount of modification needed on standard parts. P. 88

### ALUMINUM BRAZING

**Dip Method Pays**—Dip brazing brings together aluminum parts submerged in a molten flux to form a finished assembly. It eliminates the possibility of damage from overheating of precision parts. It does

the job in  $\frac{1}{3}$  the time required for torch brazing. P. 92

### CERAMIC COATINGS

**Uses Grow**—A new technology is evolving around the use of ceramic coatings on metals. Ceramic-metal combinations will withstand 2100°F for 100 hours before showing oxidation or burnoff. P. 94

### FLUE DUST TREATMENT

**Recovers Iron**—Ferro coke, a carbonized blend of coal and blast furnace flue dust, turns out to be an easy, practical way to solve the flue dust problem. It's a way of sintering, without a sintering plant, simply through using conventional coke ovens. P. 96

## MARKETS & PRICES

### HOUSING STARTS

**Aid Metal Sales**—Construction of about 1.1 million homes this year is good news for metalworking. There's growing trend to more pre-fab units which require steel and aluminum. P. 49

## NEXT WEEK

### LOW-COST HANDLING

**For Standard Machines**—Can you make automatic handling pay in linking standard machine tools, or must everything be bought special? Next week's feature shows how low-cost gravity transfer units link standard machine tools. It's a simple method suited to most shops.

### AUTO PRICE TAGS

**Law In Effect**—Federal Automobile Information Disclosure Act requires all new cars to carry stickers showing manufacturer's suggested price. Buick is first to comply. P. 62

### MISSILE CONTRACTS

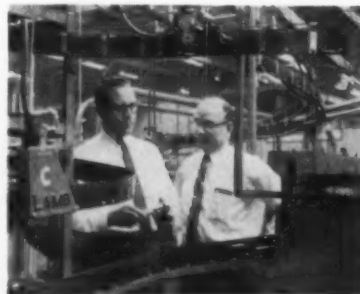
**Air Force Watches Costs**—Exorbitant pricing by missile contractors is never justified, says USAF materiel chief. Air Force will check dollar value carefully in future contract awards, he warns. P. 69

### STEEL OUTLOOK

**A Good Fourth Quarter**—You can look for a fairly strong steel market in fourth quarter. Automotive uncertainty appears to have been dissipated. P. 137

### SELECTING ADHESIVES

**Choose Carefully**—Getting the best adhesives for each metal-to-metal bonding job isn't easy, expert says. He suggests studying the application and making tests with several sample bonds. P. 138



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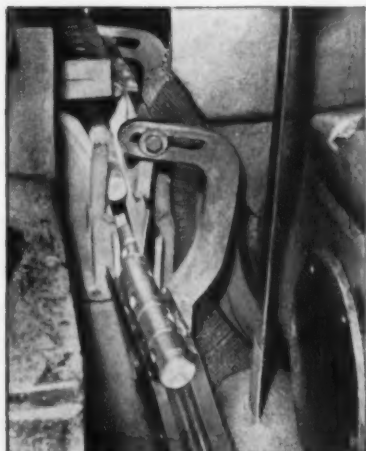
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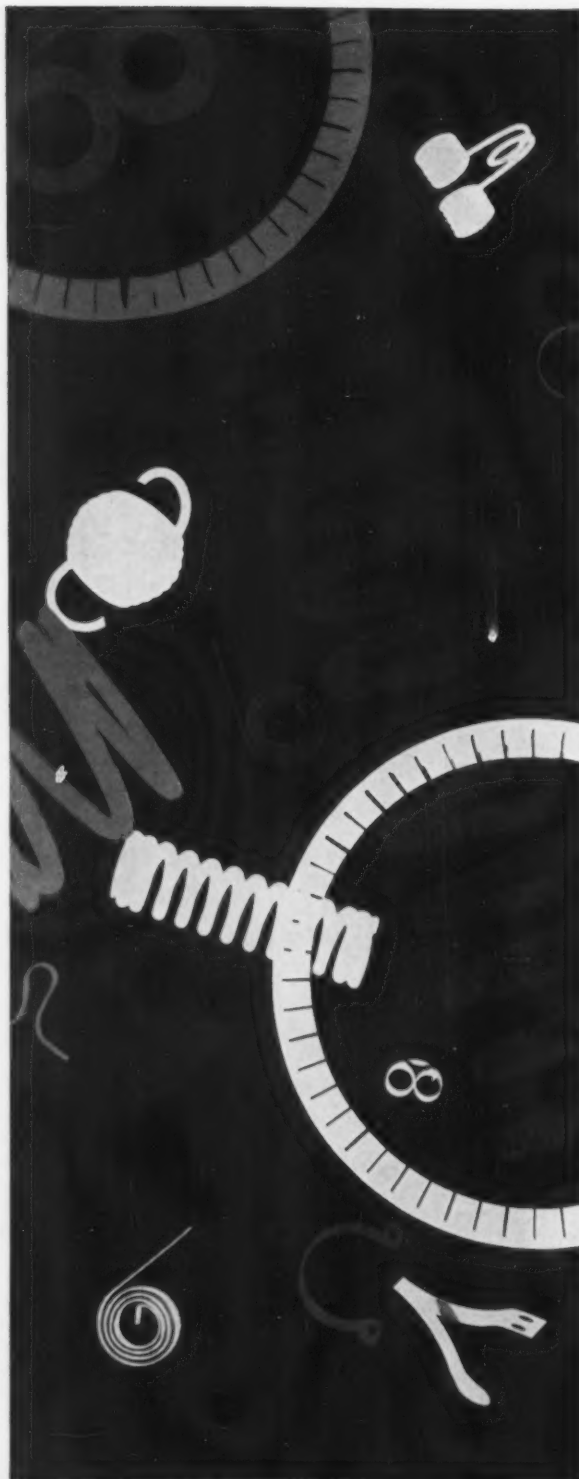
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## ARMCO STEEL



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# Steel Labor Outlook: Looks Like Rough Going

It has been said that if Dave McDonald received complete support at the Steelworkers' convention last week he might go easy on the steel firms next year. The idea was—and where it came from is a mystery—that secure in the saddle, Dave would not have to “prove” himself. From a realistic standpoint it was a bogus idea.

Dave got the support from the entire convention except for a few insurgents who were unable to stir up much rebellion. The mood of the delegates was hard and touchy about rebels, members of the press, and those who did not praise Dave enough. It dispelled any idea that things will be less than extra tough next year.

All through the convention—on and off the floor—one got the idea that the steel union would push hard for another of its big packages. There was no disposition of any kind to “take it easy.” With that kind of support it is certainly in the realm of fantasy to expect Mr. McDonald to forego an attempt to get more wages, more fringe, and a more solid position for himself.

This suggests that management has a tough job ahead of it. Some steel firms have indicated that they hope to stave off another big wage increase—and hence a price increase. Many of

their customers feel strongly that the steel industry should stand firm against another wage round. Others feel this would be too difficult to realize. But they think the steel union should be faced with the strongest determination yet to cut down the annual wage increases.

If that is the mood of steel customers then many of them appear to be laying the groundwork for a steel shortage if there is a long strike next year—as it now appears there will be; based on views of labor and management.

Many customers are committed to hand-to-mouth buying which if continued well into next year will find many users clamoring for steel next May and June. That would be pretty late to obtain enough supplies to weather a long strike.

Historically, steel users phone, telegraph, and write to their suppliers demanding a stiff front against the steel union. Later when and if there is a strike and supplies become short many of the same customers put the heat on steel firms to settle so they may obtain some steel.

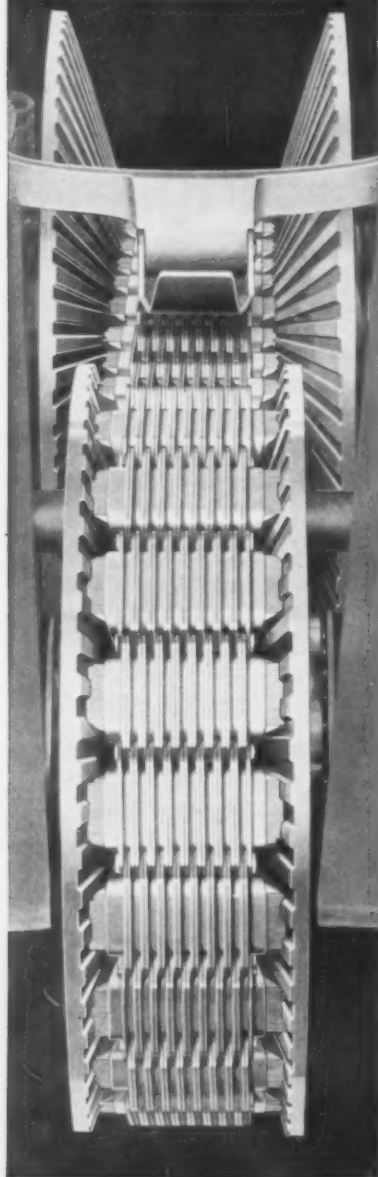
The steel industry will face a tough battle next year when it attempts to stay the wage spiral. And it looks as if it will get little support outside the industry.

*Tom Campbell*  
Editor-in-Chief

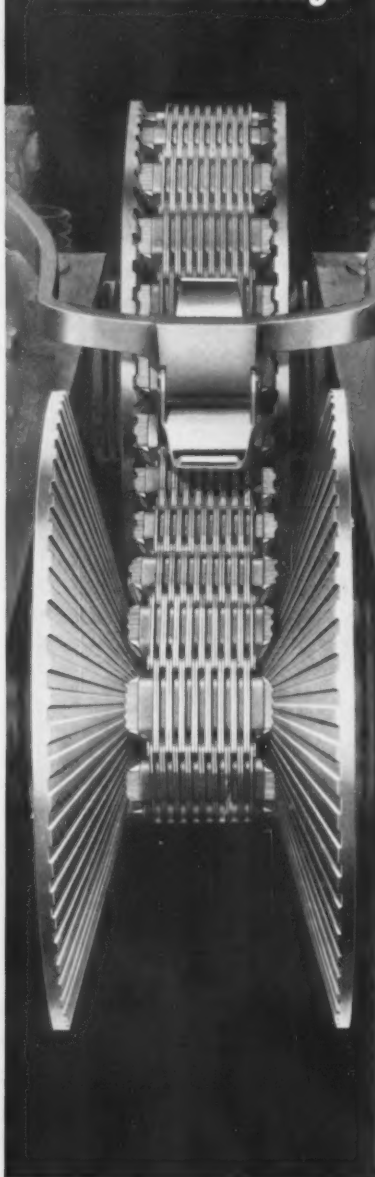
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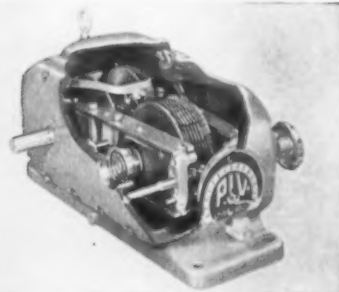
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## LETTERS FROM READERS

### Inflation

**Sir**—Your editorial "By Any Other Name Inflation is Still Bad" in the Aug. 28 issue of *The IRON AGE* was extremely worthwhile. We were so impressed that we felt others, especially our employees, should have the opportunity to read it. The editorial is timely, right to the point, and full of facts.

Each month we issue a plant magazine distributed to about 600 employees. We would like permission to use the editorial in its present form in our magazine.—L. V. Walcott, personnel director, McInerney Spring & Wire Co., Grand Rapids, Mich.

■ Permission granted.—Ed.

**Sir**—The editorial, By Any Other Name Inflation Is Still Bad, is very well done and timely.—J. P. Wolcott, Chairman, Federal Deposit Insurance Corp., Washington, D. C.

### Updating Draftsmen

**Sir**—We were happy to read about the work of the Design and Drafting Council of Delaware Valley in your Aug. 28 article "Updating Space Age Draftsmen." It certainly is a problem which many companies, including ourselves, are



wrestling with today. Could you give us some contacts for getting more information on the findings and recommendations made by the Philadelphia group?—N. J. Hebert, Chief Design Engr., Architectural Div., Benson Mfg. Co., Kansas City, Mo.

■ For more information on the Council we suggest you write Russell A. Lampman, c/o Burroughs Research Center, Paoli, Pa. or Joseph D. Dolan, U. S. Dept. of Labor, Phila.

### About Controls

**Sir**—Your editorial for the Aug. 21 issue (Controls Won't Work: In Peace or in War) was excellent. These days there seem to be very few people who will speak out so courageously for the free-market.

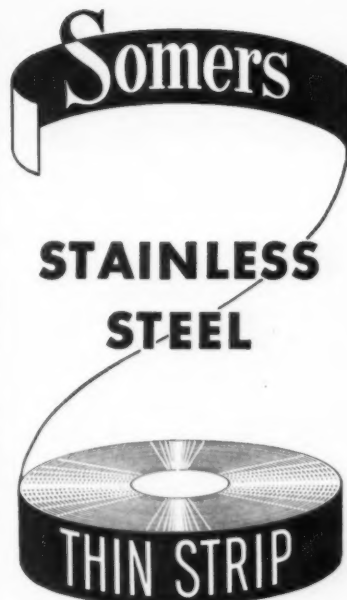
However, there is one cardinal principle we should keep in mind when the problem of inflation is discussed. Government alone is responsible for the inflation we are experiencing . . . taking upon itself responsibility for the manufacture and quality of the money supply. It has decided that we can use for money some pieces of paper which can only be exchanged for other pieces of paper! Down through the years such practices have always produced and always will produce inflation.—K. S. Wood, pres., Wood Brothers Mfg. Co., Oregon, Ill.

### Chemical Machining

**Sir**—In your Aug. 21 issue there was a reference to electrochemical machining.

Will you kindly tell me where further information on this process may be obtained.—F. B. Richter, Div. Trainer, American Brass Co., Ansonia, Conn.

■ Contact Thomas Larkins, Elox Corp., Birmingham, Mich.



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Operators testing Kaiser brick against competitive brands consistently come up with reports like these—proof of the money-saving performance advantages you gain with Kaiser Periclase Chrome Brick. Here are the properties that make possible such performance:

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## FATIGUE CRACKS

### The Putting-on Tool

The search for that miraculous, but elusive, aid of the machinist—the putting-on tool—is described in this poem reprinted from the Observer, published by the Metal & Thermit Corp., Rahway, N. J.

In his youth he essayed  
The machinists' trade.  
One day while running his lathe,  
He cut off too much  
Of the steel in his clutch—  
And expected his foreman to scathe.

"Don't worry, m'son.  
What's done is done."  
(His foreman was far from irate!)  
"Just leave your work  
And ask the stock clerk  
For a 'putting-on tool' Number 8."

But wherever he went,  
This tool had been lent  
To a man in another Division.  
After walking for miles,  
He saw through their wiles.  
He never forgot their derision.

But years have flown . . .  
In a shop of his own  
He builds up parts with success.  
And the "putting-on tool"—  
Once butt of misrule—  
Is chrome plating with SRHS.\*

\* Metal & Thermit's Unichrome Self Regulating, High Speed Chromium Plating Compound.

### Can You Top This?

Industrial purchasers make a wide variety of buys—some of them pretty unusual. However, this group of items bought for Du Pont's plants in New York State are really weird.

Here they are—canoe paddles, hay knives, tinsel, an aquarium, and a supply of artificial eyes. Since we're not competing with The IRON AGE Puzzler we won't keep you in suspense. The canoe paddles?

For stirring chemicals, naturally. The hay knives and tinsel were used in cellophane processing. A laboratory wanted the aquarium to hold liquids.

And those artificial eyes? They were props in a safety campaign.

### New Puzzler

Mr. Bill Cheney writes, "This is an old problem we had in college physics some forty years past."

In a still pond is a man in a boat loaded with a rock. The man dumps the rock into the water. Will the water in the lake rise, remain the same, or drop? Whatever it does, prove it.

Don't get mad. We know we've been real lax. But here's the answer to the July 17 puzzler, the one about Scratchmoritch dunking a slightly stale bagel: 5.015 inches. If you want to argue, argue with the winners: H. A. Edwald, General Portland Cement Co., Chicago, Ill.; naturally the General Steel Castings Iron Age Puzzle Club, Charles Sec'y; H. Vogelsang, Chief Engineer, Imperial Works, U. S. Steel, Oil City, Pa.; and Anothony Carmichael, Latrobe Steel Co.

### METALS RESEARCH



"The research director hired him to wander around and ask questions."

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We make most of our tubing for men whose lives and reputations depend on perfecting perfection itself. They dare to do things like "sub-ing" the pole . . . like breaking the will of earth's gravity . . . like putting the atom into chains of service unlimited! It's usual for such people to expect us to do the impossible. The performance of TMI tubing continues to prove their confidence in TMI well-founded.

Meanwhile, TMI never stops in its program of developing new and better ways of cold drawing stainless steel and special alloy tubing in small sizes.

*We like to make the best better . . . especially when it helps you make a better product or a more satisfying profit.*



- All Types of Stainless Steel—seamless and welded
- Hastelloy\* alloys B, C, F, X, Multimet\* (N-155) alloy, and Haynes\* alloy No. 25
- One-Piece (No Weld) Round and Special Shape Bulb Capillary Units
- Multiple Diameter I.D. and O.D. Tubing to Specifications Special Shapes.

\*Reg. TM of Union Carbide and Carbon Corp.

METALLURGISTS, ENGINEERS,  
MANUFACTURERS—SPECIALISTS  
IN SMALL DIAMETER TUBING  
0.50" TO 0.25" O.D. WITH  
TOLERANCES AS CLOSE AS  
0.01" WHEN REQUIRED.

**TUBE  
METHODS  
INC.**

BRIDGEPORT (Montgomery County), PA.

**AMBALLOY...A. M. BYERS ELECTRIC FURNACE QUALITY STEEL PRODUCTS**



## **YOU CALL...WE'LL COME WITH TECHNICAL HELP**

You name the time, the place and the problem. A Byers metallurgist will be there with technical help. Often, as quick as a phone call.

Specialty steels—carbon, alloy and stainless—are areas of the metals business in which our experience could prove invaluable to you. We can work with you to determine which steels are best suited for your requirements. We've

made detailed studies of strength, hardness and microstructure of metals. You'll find us adept in many of these skills.

Or maybe you'd like to know something of the men who make our steel? Our facilities? Our tests for quality? Our packaging and loading? The Byers metallurgist has these answers. Ask him to call, soon. A. M. Byers Company, Clark Building, Pittsburgh 22, Pennsylvania.

*A growth company with the emphasis on quality and service* **A. M. BYERS COMPANY**

## COMING EXHIBITS

**Western Tool Show**—Sept. 29-Oct. 3, Shrine Exposition Hall, Los Angeles. (American Society of Tool Engineers, 10700 Puritan Ave., Detroit 38.)

**Packaging & Materials Handling Show**—Oct. 14-16, Coliseum, Chicago. (SIPMHE, 327 LaSalle St., Chicago 4.)

**Metal Show**—Oct. 27-31, Public Auditorium, Cleveland. (American Society for Metals, 7301 Euclid Ave., Cleveland 3.)

**Plastics Show**—Nov. 17-21, International Amphitheater, Chicago. (The Society of the Plastics Industry, Inc., 250 Park Ave., New York 17.)

## MEETINGS

### SEPTEMBER

**The Electrochemical Society, Inc.**—Semi-annual meeting, Sept. 28-30 and Oct. 1-2, Chateau Laurier, Ottawa, Canada. Society headquarters, 1860 Broadway, N. Y.

**Pressed Metal Institute**—Annual meeting, Sept. 28-Oct. 2, The Cloisters, Sea Island, Ga. Society headquarters, 3673 Lee Rd., Cleveland 20.

**National Screw Machine Products Assn.**—Executive seminar, Sept. 30-Oct. 1, Brock-Sheraton Hotel, Niagara Falls, Canada. Society headquarters, 2860 E. 130th St., Cleveland.

### OCTOBER

**National Assn. of Sheet Metal Distributors**—Fall meeting, Oct. 5-8, Marlborough-Blenheim Hotel, Atlantic City. Society headquarters, 1900 Arch St., Philadelphia.

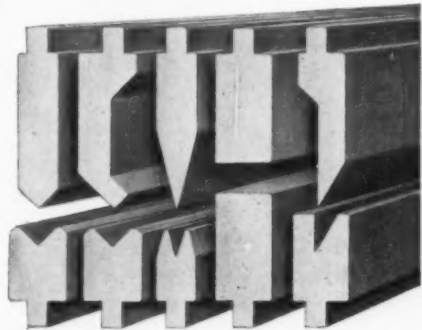
**Truck Body & Equipment Assn., Inc.**—Annual convention and exhibit, Oct. 6-8, Ambassador Hotel, Atlantic City. Society headquarters, 1616 K St., N. W., Washington, D. C.

**Gray Iron Founders' Society, Inc.**—National annual meeting, Oct. 8-10, Sheraton-Park Hotel, Washington. Society headquarters, 930

(Continued on P. 16)

- .....
- **ALABAMA**
- Birmingham
- Hinkle Supply Co., Inc.—FAirfax 2-4541
- **CALIFORNIA**
- Los Angeles
- Meyer Sheet Metal Mchry. Co.—VAN Dyke 1477
- San Francisco
- Harron, Rickard & McCone Co.—ATwater 2-2202
- **GEORGIA**
- Atlanta
- Allison Mchry. Co.—JACKSON 4-1741
- **INDIANA**
- Indianapolis
- E. L. Humston Co., Inc.—WALnut 5-9691
- **IOWA**
- Bonaparte
- Corry's Machine & Tool Co.—Phone: 112
- **KANSAS**
- Wichita
- Elfeldt Mchry. & Supply Co.—AMherst 7-9773
- **MASSACHUSETTS**
- Cambridge
- Austin-Hastings Co., Inc.—KIRKland 7-4480
- **MICHIGAN**
- Detroit
- J. Lee Hackett Co.—TRinity 2-6442
- **MINNESOTA**
- Minneapolis
- Minnesota Steel Supply Co.—FEDeral 3-6273
- **MISSOURI**
- Kansas City
- Elfeldt Mchry. & Supply Co.—VICTor 2-5494
- **NEW YORK**
- New York
- Federal Machinery Corp.—CANal 6-3022
- Triplex Machine Tool Corp.—HANover 2-4520
- H. Weiss & Co.—CANal 6-4256
- **NORTH CAROLINA**
- Greensboro
- Armentrout Mchry. Co.—Phone: 4-8218
- **OHIO**
- Cincinnati
- Cincinnati Mchry. Co., Inc.—TRinity 1-0853
- Cleveland
- George D. Miller Co.—MAIn 1-1667
- **OKLAHOMA**
- Oklahoma City
- Hart Industrial Supply Co.—REgent 9-2541
- Tulsa
- Hart Industrial Supply Co.—LUTher 3-2175
- **OREGON**
- Portland
- Pacific Metal Co.—CAPitol 7-0693
- **PENNSYLVANIA**
- Philadelphia
- Delaware Valley Mchry., Inc.—Willow Grove 4600
- Milton Equipment Co.—WALnut 2-1734
- Pittsburgh
- Wm. K. Slamets Co.—ATlantic 1-8091
- **TENNESSEE**
- Nashville
- Pearl Equipment Co.—CHApel 2-5476
- **TEXAS**
- Dallas
- Briggs-Waaver Mchry. Co.—LAKeside 8-0311
- Fort Worth
- Briggs-Waaver Mchry. Co.—EDison 6-5621
- Houston
- Mehl Machinery, Inc.—FAirfax 3-1313
- **WASHINGTON**
- Seattle
- Pacific Metal Co.—MAIn 6925
- **WISCONSIN**
- Eau Claire
- Production Equip. Inc.—TEmple 2-3483
- Milwaukee
- Production Equip. Inc.—GREENfield 6-6075
- **CANADA**
- A. R. Williams Machinery Co., Ltd.
- **ALBERTA**
- Calgary—Phone: 5-4425
- Edmonton—Phone: 24341
- **BRITISH COLUMBIA**
- Vancouver—TAllow 9411
- Victoria—Phone: 4-7623
- **MANITOBA**
- Winnipeg—SPruce 4-4458
- **NOVA SCOTIA**
- Halifax—Phone: 5-4389
- **ONTARIO**
- Hamilton—JACKSON 9-5388
- Ottawa—CENTral 6-3661
- Toronto—EMpire 4-2381
- Windsor—CLEARwater 4-4762
- **QUEBEC**
- Montreal—RIVERSide 8-9381
- 8487
- .....

## Off-the-shelf DELIVERY



## CHICAGO® Induction Hardened\* PRESS BRAKE DIES

This organization of local distributors offers immediate delivery on many CHICAGO induction hardened press brake dies. These stock dies are economical, and the quick delivery saves time in tooling. They are available in any length from 4 to 12 feet in increments of 2 feet.

Stock dies are used for a surprisingly large variety of bending operations. And, with CHICAGO induction hardened dies you get bonus performance and increased die life at no extra cost. Remember, these dies can be used in any make or size of standard press brake.

On your needs for press brake dies, call your nearest distributor listed here. With Bulletin D-457 you can order by number. Ask for a copy.

\*Induction hardening is a special, high-frequency process used to harden the wear surfaces of CHICAGO dies. Field reports on CHICAGO induction hardened dies show up to ten times longer life than conventional press brake dies.

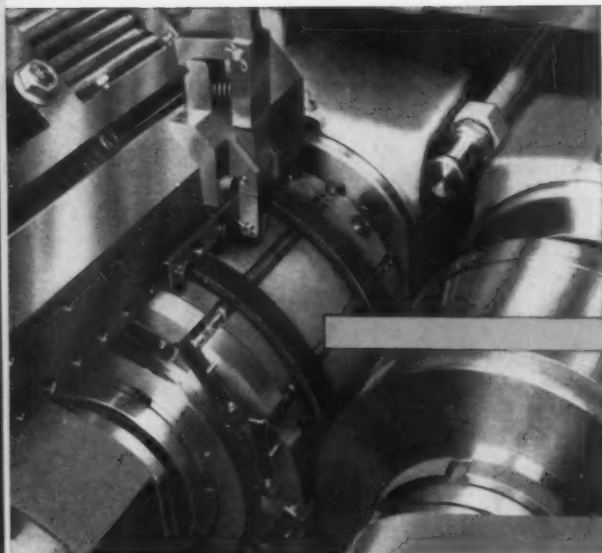


Press Brakes, Press Brake Dies  
Straight-Side-Type Presses

Hand and Power Bending Brakes  
Special Metal-Forming Machines

## DREIS & KRUMP MANUFACTURING CO.

7430 South Loomis Boulevard  
Chicago 36, Illinois

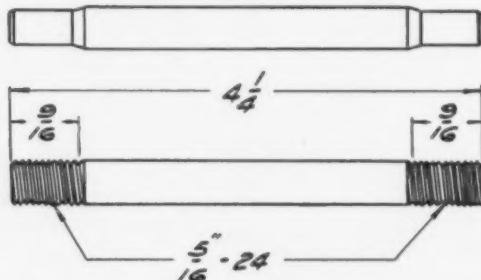


## 264 threads per minute

### (132 double-end studs) \*

*Both Threads Rolled to a Class 3 Fit by the Lanhyrol Machine in a Single Threading Cycle . . . at Columbus Bolt and Forging Co. (Columbus, O.)*

*More than 350,000 Parts Per Die Set . . . over 3½ times the die life realized from other previous thread rolling methods.*



*AISI 1335 and 1041 Steel (210-220 Brinell) as Cold-Drawn and Extruded . . . not spheroidized or annealed.*

*Larger and Longer Sizes, Both Single and Double-End Studs, Can Be Rolled . . . manual, semi-automatic or automatic rolling can be accomplished by the same machine on standard fasteners or highly specialized parts. Automatic hopper feeding and orienting devices available for automated operations. Ask for Bulletin E-60 . . . send specifications.*

\*LANDIS Research and Development has currently completed improvements in this process to increase the present production to 320 threads (160 studs) per minute with an even greater roll life.

511C

## LANDIS Machine COMPANY

WAYNESBORO • PENNSYLVANIA • U. S. A.

THE WORLD'S LARGEST MANUFACTURER OF THREADING EQUIPMENT \* CUTTING \* TAPPING \* GRINDING \* ROLLING







**SHEPARD NILES**

**SINGLE BEAM CRANES**

# WHICH CRANE

**... Over-running or Under-running?**



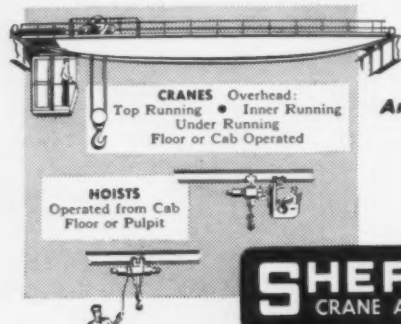
OVER-RUNNING where double beam cranes are not practical or for auxiliary service.



UNDER-RUNNING . . . for limited clearances . . . operating on runways hung from roof trusses!

Cut costly ground level handling. Move loads smoothly and safely overhead with Shepard Niles single beam cranes. Operate from floor or remote location. Push type or motor driven trolley type hoists, including close clearance units.

Send for Single Beam Crane bulletins today . . . or ask that a Shepard Niles representative call — there's NO OBLIGATION.



**Building**

**America's Most Complete Line**

**of Cranes and Hoists**

**Since 1903**

**SHEPARD NILES**  
CRANE AND HOIST CORPORATION

1489 Schuyler Ave., Montour Falls, N. Y.

## EXHIBITS, MEETINGS

(Continued from P. 13)

National City-E 6th Bldg., Cleveland.

**The Wire Assn.**—Annual convention, Oct. 13-16, Chalfonte-Haddon Hall, Atlantic City. Society headquarters, 543 Main St., Stamford, Conn.

**American Society of Civil Engineers**—Annual convention, Oct. 13-17, Hotel Statler-Hilton, New York. Society headquarters, 33 W. 39th St., New York 18.

**Hoist Manufacturers Assn.**—Membership meeting, Oct. 14, Warwick Hotel, Philadelphia. Society headquarters, One Thomas Circle, Washington 5, D. C.

**Wire Reinforcement Institute, Inc.**—Annual fall meeting, Oct. 14-15, Park Plaza Hotel, St. Louis, Mo. Society headquarters, National Press Bldg., Washington 4, D. C.

**American Machine Tool Distributors' Assn.**—Annual meeting, Oct. 15-17, Sheraton Plaza, Boston. Society headquarters, 1900 Arch St., Philadelphia.

**The Magnesium Assn.**—Annual convention, Oct. 16-17, Fort Shelby Hotel, Detroit. Society headquarters, Chanin Bldg., 122 E. 42nd St., New York 17.

**Foundry Equipment Manufacturers Assn., Inc.**—Annual meeting, Oct. 16-18, Greenbrier Hotel, White Sulphur Springs, W. Va. Society headquarters, One Thomas Circle, Washington 5, D. C.

**Conveyor Equipment Manufacturers Assn.**—Annual meeting, Oct. 18-21, Greenbrier Hotel, White Sulphur Springs, W. Va. Society headquarters, One Thomas Circle, Washington 5, D. C.

**American Coke & Coal Chemicals Institute**—Annual meeting, Oct. 20-21, Greenbrier Hotel, White Sulphur Springs, W. Va. Society headquarters, 711 14th St., N. W., Washington, D. C.

**Rail Steel Bar Assn.**—Semi-annual meeting, Oct. 20-22, Blackstone Hotel, Chicago. Society headquarters, 38 S. Dearborn St., Chicago.



in  
impacts...

d'Arazien

## Alcoa puts the metal where you want it

Before you read on, blink your eyes. In the time it took to do that, this man has produced an entire automotive grease gun body—complete with external ribs; solid end; smooth, seamless interior; and go-to-market external finish.

Sound too easy? No! We can make round, oval, square and irregular parts the same way. Finished parts—with the strength of forgings—with tolerances down to plus or minus 0.005"—with a smooth, corrosion-resistant finish of about 125 microinches. A clear case of putting the metal where you want it. The cost of tooling for impacts is

surprisingly low, too. A good rule to remember is that virtually any closed end or tubular design should be considered as an Alcoa® Impact.

In impacts, as well as forgings, castings, extrusions and screw machine parts . . . Alcoa puts the metal where you want it. A call to Alcoa can mean fewer rejects or ingenious design solutions . . . less waste in production or a product that sells faster. Start now; write for Alcoa Up-to-Daters, a file of design tips on Alcoa Engineered Products. Aluminum Company of America, 1999 Alcoa Building, Pittsburgh 19, Pennsylvania.



*Alcoa puts the metal where you want it—in castings, forgings, extrusions, screw machine parts and impacts.*



**ALCOA THEATRE**  
FINE ENTERTAINMENT  
ALTERNATE MONDAY EVENINGS

## ANOTHER INDUCTO INSTALLATION...

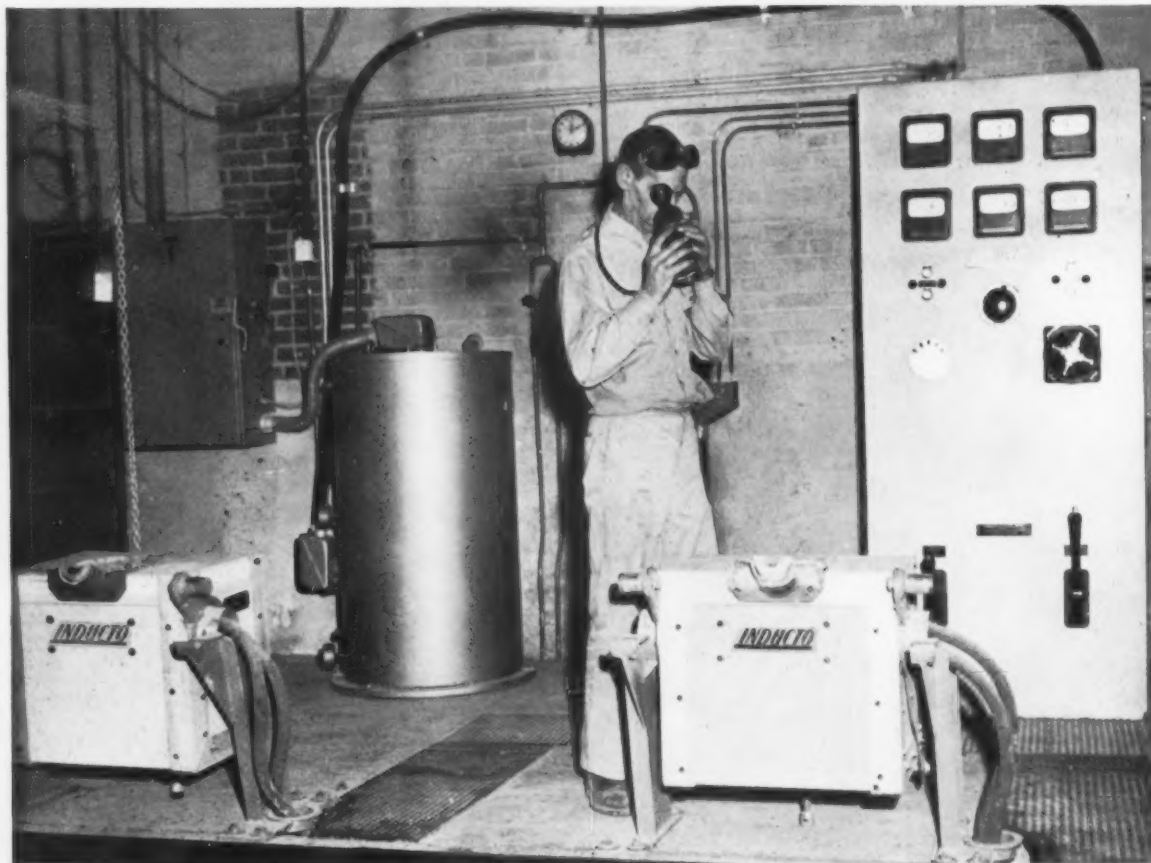


PHOTO COURTESY OF CONNECTICUT INVESTMENT CASTING CORP.

### Connecticut Investment Casting Gets Accurate Heat Control In Every Melt With INDUCTO Furnaces

When melting steel alloys for precision casting, precise temperature control is an important factor. Of course, controllable analysis of the alloys in heat after heat, homogeneity of each melt and high melting speeds are important, too! That is why Connecticut Investment Casting Corporation selected INDUCTO furnaces for the job.

INDUCTO high-frequency induction furnaces and controls have proven ideal for precision casting methods. For in addition to fast, clean, accurate melting, they are compact, efficient and designed for long, maintenance-free service.

The furnaces have sturdy welded frames which minimize distortion and assure longer lining life. The water-cooled leads enter the furnace through the trunnion thereby reducing the twisting and flexing which shorten lead life.

The control is compact and easy to operate. Furnace selector switches are conveniently mounted on the front of the panel. The control is shipped completely assembled and ready for installation.

For more complete details, write for Bulletin 70. Inductotherm Corporation, 412 Illinois Avenue, Delanco, N. J.



**INDUCTOTHERM**  
corporation

*A 3M Case History Report*

## GRINDING PRODUCTION INCREASED 10% WITH 3M ABRASIVE BELTS

PRE-FINISHING

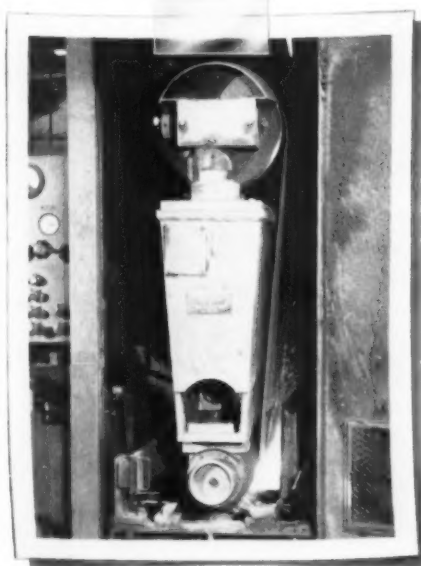
**MANUFACTURER:** Houdaille Industries, Inc.

**ADDRESS:** Huntington, W. Virginia

**PRODUCTS MANUFACTURED:**  
Auto Bumpers

**HOW 3M ABRASIVES ARE USED:**

"PRODUCTION" Brand Paper Belts are used to pre-finish hot-rolled steel alloy sheets prior to forming and plating.



**OPERATIONAL DATA ON 3M METHOD:** 3M Paper Belts in grits 80, 100, and 150 are used on a 12-head fully automatic sheet-polishing line. New and used belts are alternated in a specific sequence to get maximum belt life and best finish.

**PROVEN ADVANTAGES OF 3M METHOD:** Customer's own tests established a 10% increase in production using 3M belts. 3M has been selected as major supplier on the basis of this, plus consistent quality and expert engineering assistance provided.

**OTHER 3M ABRASIVE PRODUCTS IN USE:** "TRI-M-ITE" Resin Bond Cloth "PG" Wheels; "Three-M-ite" Resin Bond Cloth Belts, and 3M Type "C" Fibre Discs are used for occasional clean-up and blending operations.

**WANT MORE INFORMATION?** Send for free manual, "Finishing Steel with 3M Coated Abrasives". Write to 3M Co., St. Paul 6, Minn., DD-98.

"PRODUCTION," "TRI-M-ITE," and "THREE-M-ITE" are registered trademarks of 3M Company, St. Paul 6, Minn. Export: 99 Park Ave., New York, Canada: London, Ontario.

## 3M Coated Abrasives

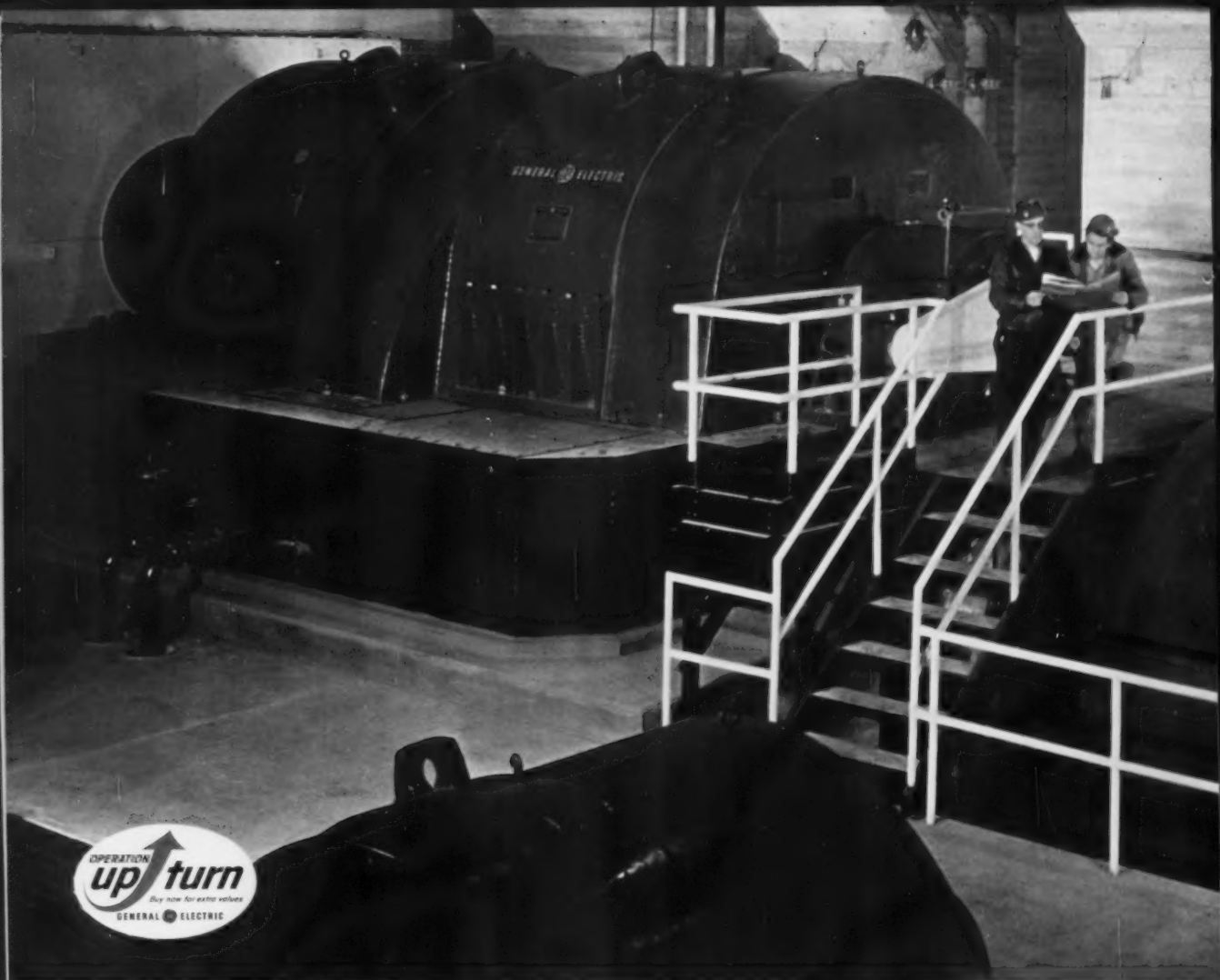
"PRODUCTION" PAPER BELTS

**MINNESOTA MINING AND MANUFACTURING COMPANY**

...WHERE RESEARCH IS THE KEY TO TOMORROW







GENERAL ELECTRIC ANNOUNCES . . .

# Revolutionary Redesign for

With "ease of maintenance" as the major criterion, General Electric engineers recently completed the dramatic redesign of large direct-current motors for metal rolling mill applications.

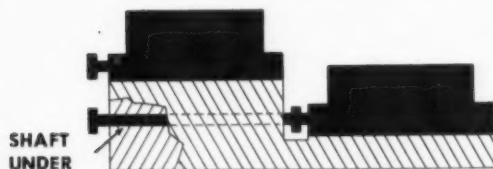
The result of a complete re-analysis of industry drive requirements, the new standard G-E metal rolling mill motors are forced ventilated, and are furnished with enclosing covers and Class B insulation throughout.

**REVOLUTIONARY "TOP-FORWARD"** twin-drive arrangement exemplifies G.E.'s emphasis on "ease of maintenance." The top motor is located nearest the mill with the rear motor shaft running underneath. This unique arrangement makes both motors more accessible for fast, easy maintenance, and substantially reduces installation and construction costs.

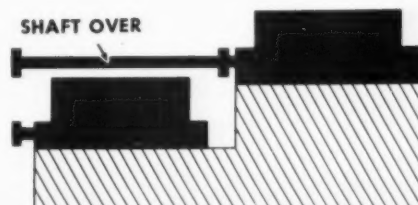
Other extra-value features available now include quick-removable air shields, which eliminate



**NEW GENERAL ELECTRIC  
"TOP-FORWARD" ARRANGEMENT**



**CONVENTIONAL  
ARRANGEMENT**



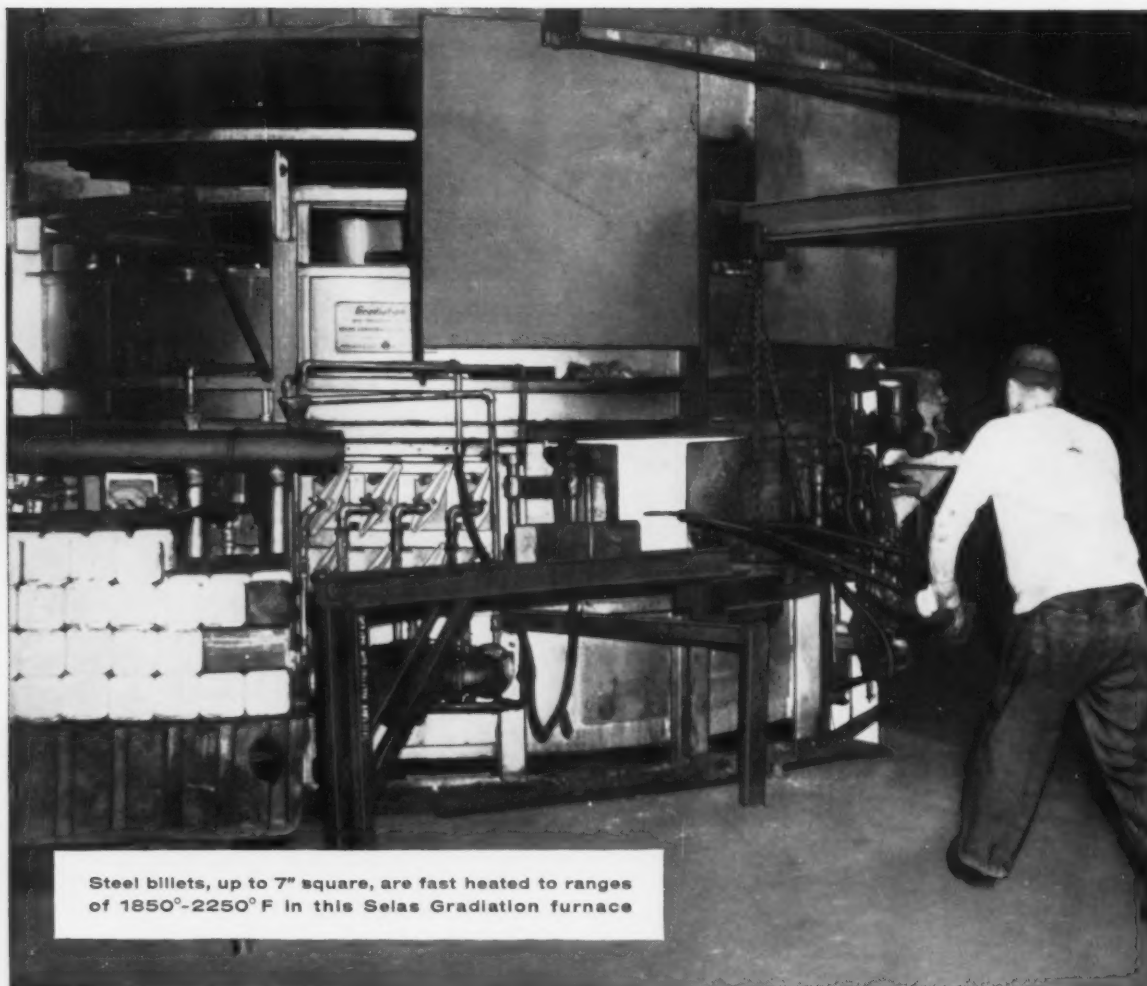
# Metal Rolling Mill Motors

time-consuming unbolting; constant-pressure brush holders, requiring no brush pressure adjustment; use of self-locking nuts and bolts to fasten internal components; and built-in inspection light, utility outlet, plus many other features designed to make maintenance faster, easier.

A **COLORFUL NEW BROCHURE**, GEA-6812, "D-c Drives for Metal Rolling Mills," describes this revolutionary new design. Contact your nearest General Electric Apparatus Sales Office, or write for it today. General Electric Company, Section 772-6, Schenectady 5, New York.

*Progress Is Our Most Important Product*

**GENERAL**  **ELECTRIC**



Steel billets, up to 7" square, are fast heated to ranges of 1850°-2250° F in this Selsas Gradation furnace

## FAST HEATING WITH *GAS*

- improves forgeability
- reduces power requirements
- increases metal flow

A Gas-fired Gradation® furnace designed and built by Selsas Corporation for Lansdowne Steel and Iron Company, Morton, Pennsylvania heats billets to 1850°-2250° F at rates of 2 to 5 minutes per inch of thickness—thus virtually eliminating scale. Some fast heated billets are forged at temperatures 300° F below conventional methods.

Improved forgeability, directly attributable to fast heating with Gas, reduces power requirements

at the usual forging temperatures. Or, for given power applied, permits an increase in the amount of flow or deformation.

For information on how Gas equipment can help you in your production operations, call your Gas Company's industrial specialist. He'll be glad to discuss the economies and outstanding results you get with Gas and modern Gas equipment. *American Gas Association.*



# BLACK SATIN

a new, smooth  
oil tempered wire finish

"Black Satin"... that's the best way  
of describing the new, fine powdery  
oxide finish on CF&I-Wickwire  
Oil Tempered Wire.

It's a finish that makes our wire  
easier for you to work with...  
reduces your production costs... and is  
available in long 600 lb. continuous  
unwelded lengths.





# BLACK SATIN

an improved Oil Tempered Wire finish available from CF&I-Wickwire

This powdery finish acts as a lubricant during your coiling and crimping operations. There are no large surface scales to "flake-off". Thus, constant readjustment of your original setup is reduced during production runs. The quality and quantity of your output will remain high without expensive downtime.

**Uniformity Reduces Production Costs**—Because our Black Satin finish is extremely uniform from one end of a coil to the other, from coil-to-coil, and from lot-to-lot, setup time is minimized. Your output per shift will increase as your equipment will not have to be altered to cope with the varying physical properties of the finish occasionally encountered in coils of Oil Tempered Wire. Scrap losses are reduced because production machinery can run continuously—"stop and go" operations are almost nil when new coils are started.

**Extra Large Coils Increase Output**—CF&I can further help reduce production costs through our processing and packaging facilities which make it possible to provide extra long coils that lessen the number of setups and resulting scrap loss. If your product is one which (because of production volume or physical size) requires the use of large quantities of Oil Tempered Wire, use our large coils which are available from 16" to 72" in diameter. A full range of sizes, grades and finishes of Oil Tempered Wire is available in 600 lb. continuous *unwelded* lengths. Straightened and cut lengths from 6' to 24 feet (or longer) can also be supplied.

If you are not set up to handle long-length coils, smaller weight packages are available.

**Color Tag Identification Assures Quality**—Every coil of CF&I-Wickwire Oil Tempered Wire is color-tagged with a complete record of its processing, testing and intended use.

Once you have selected the grade of Oil Tempered Wire that's best for your purpose, you can be sure of receiving the same quality on subsequent orders.



These tags, 3 of which are illustrated, show

Heat Number \_\_\_\_\_ Size \_\_\_\_\_  
Tensile Strength \_\_\_\_\_  
Date \_\_\_\_\_ Coil Number \_\_\_\_\_  
Test Sheet Number \_\_\_\_\_

This identification system helps simplify your job of inventory control, in-plant storage, handling, and reordering.

When You Need Steel Wire Make CF&I Your Source of Supply. Oil Tempered Wire is but one of the many types of specialty wire produced by CF&I. To meet your needs and cut your costs, they can be supplied in a variety of packages: on returnable "Spiders" holding a single continuous length of wire weighing from 2000 to 4000 lbs.; on non-returnable "Spiders" with 500-700 lbs. capacity; in fibre-drums holding up to 600 lbs. of wire; in steel-strapped or wire tied coils (200 to 2000 lbs.) and in bare or paper-wrapped coils, or in 500 to 800 lb. capacity reels.

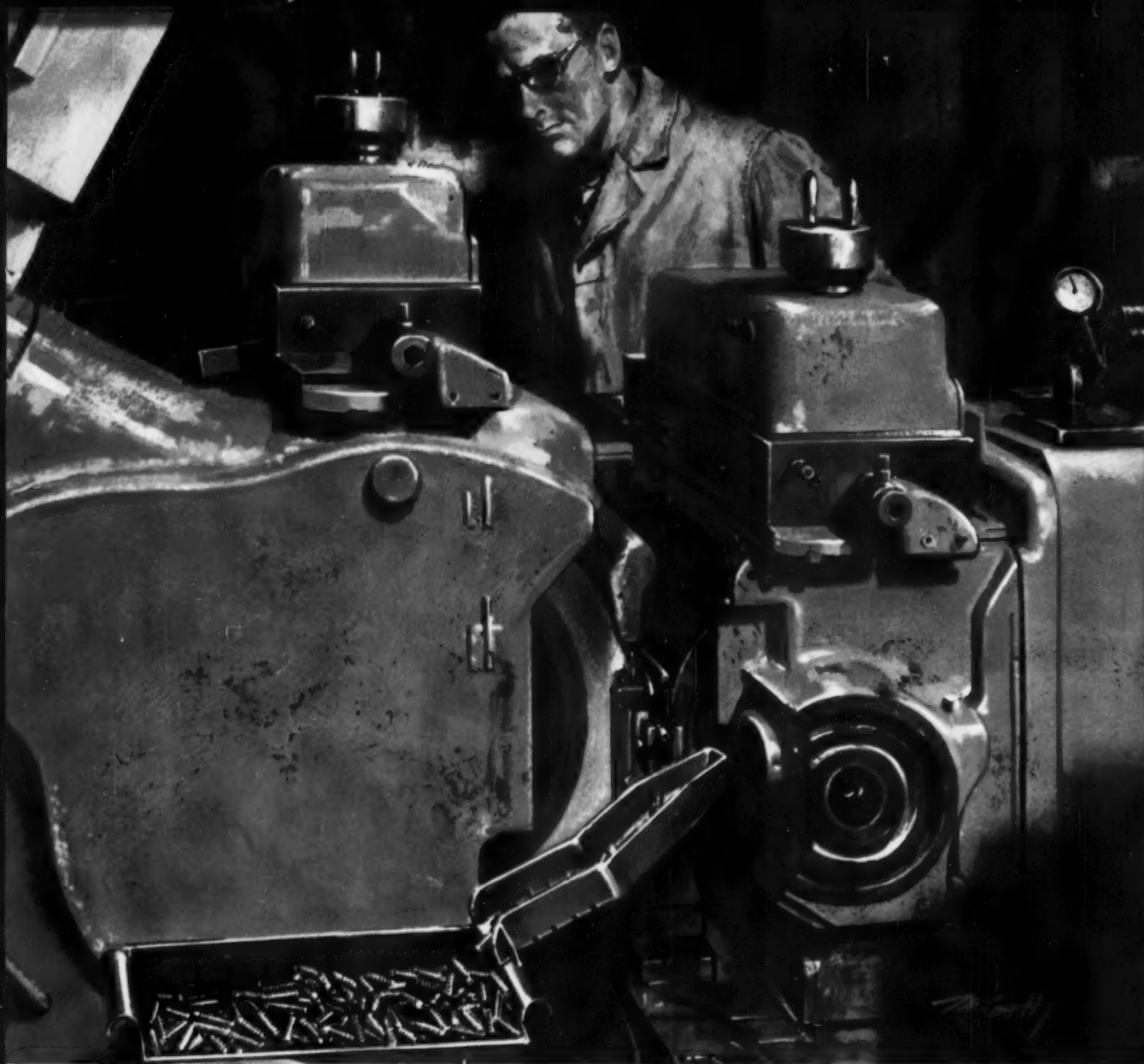


## CF&I-WICKWIRE WIRE

THE COLORADO FUEL AND IRON CORPORATION

THE COLORADO FUEL AND IRON CORPORATION—Albuquerque • Amarillo • Billings • Boise • Butte • Denver • El Paso • Ft. Worth • Houston • Kansas City • Lincoln • Oklahoma City • Phoenix • Pueblo • Salt Lake City • Wichita • PACIFIC COAST DIVISION—Los Angeles • Oakland • Portland • San Francisco • San Leandro • Seattle • Spokane • WICKWIRE SPENCER STEEL DIVISION—Atlanta • Boston • Buffalo • Chicago • Detroit • New Orleans • New York • Philadelphia • CF&I OFFICE IN CANADA: Montreal • CANADIAN REPRESENTATIVES AT: Calgary • Edmonton • Vancouver • Winnipeg





## How 7,000 pieces per hour get the "Touch of Gold"

Here a centerless thread grinder is adding value the most modern way . . . applying the "Touch of Gold" automatically, with a Norton crush-trued wheel that is grinding threads in set screws at an average rate of 7,000 per hour.

You too can benefit by Norton leadership in continually improving grinding wheels and grinding methods . . . which

helps proportion your labor, overhead and wheel costs as favorably as possible, so that you can produce with increased efficiency and economy.

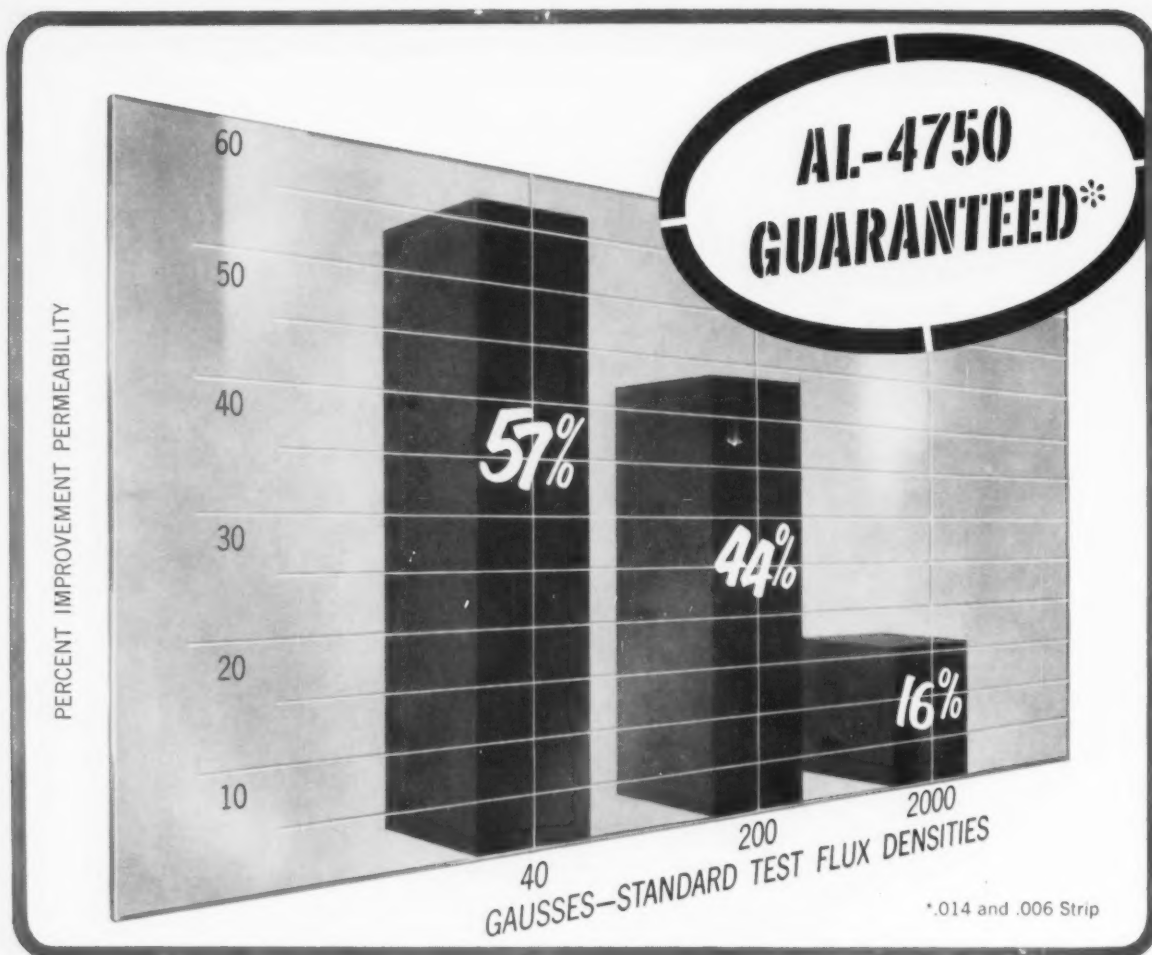
Norton stocks more than 200,000 types and sizes of grinding wheels . . . and brings to every industrial area the many products and services that have become synonymous with the "Touch of Gold".

NORTON COMPANY, General Offices,  
Worcester 6, Massachusetts.



**Making better products...to make your products better**

**Experience—the added alloy in A-L Stainless, Electrical and Tool Steels**



## **GUARANTEED PERMEABILITY... and at higher values than old average values in AL-4750**

AL-4750 nickel-iron strip now has higher permeability values than ever before . . . and the new, higher values are guaranteed. For example, using the standard flux density test, at 40 induction gauss, AL-4750 now has 57% higher permeability than in the past. And permeability values are guaranteed.

This guaranteed permeability means greater consistency and better predictability for magnetic core performance . . . permits careful, high performance design.

The improvement in AL-4750 didn't just happen. It is the result of Allegheny's electrical alloy research and production program in nickel-bearing steels. A similar improvement has been made in AL Moly Permalloy.

And research is continuing on silicon steels including AL's famous Silectron (grain oriented silicon steel), as well as on other magnetic alloys.

Another service of Allegheny Ludlum includes complete facilities for the fabrication and heat treatment of laminations. Years of experience in AL's lamination department means that Allegheny Ludlum has encountered and solved most problems common to core materials. This practical know-how is available to all. Call us for prompt technical assistance. Write for blue sheet EM-16 for complete data on AL-4750.

*Allegheny Ludlum Steel Corporation, Oliver Building, Pittsburgh 22, Pa. Address Dept. A-9A.*

WSW 7289

## **ALLEGHENY LUDLUM**

**STEELMAKERS TO THE ELECTRICAL INDUSTRY**

Export distribution, Electrical Materials: AIRCO INTERNATIONAL INC., NYC 17  
Export distribution, Laminations: AD. AURIEMA, NYC 4



**"Try Aetna-Standard for  
that item...they make all  
kinds of equipment for  
processing metals."**

**SHEET and STRIP**

Bending Machines  
Continuous Strip Picklers  
Levellers (2 and 4 High)  
Rectifier Levellers  
Heavy Plate Levellers  
Oiling Machines  
Shears—Down and Upcut  
Coil Boxes  
Reels (Pay-Off and Tension)  
Upcoilers  
Processors  
Pilers  
Side Trimmers and Slitters  
Scrap Ballers  
Stretcher Levellers  
Scrubbing and Drying Machines  
Uncoiling Levellers  
Rewinding Reels  
Down Coilers  
Coil Breakers  
Cut-to-Length Lines  
Side Trimming Lines  
Slitting Lines  
Scrubbing and Drying Lines  
Straightaway and Right Angle  
Tinning Units  
Continuous Electrolytic Tinning Lines  
Automatic Plate Classifying Machines  
Wet and Dry Cleaning Machines  
Continuous Strip Galvanizing Lines  
Sheet Galvanizing Lines

**Continuous Strip Long Terme Lines  
Sheet Long Terme Lines**

**PIPE and TUBE**

Seamless Tube Mills  
Piercing Mills  
Plug Mills  
Reelers  
Sizing Mills  
Reducing Mills  
Tube Expander  
Billet Peeler  
Continuous Tube Rolling Mills  
Continuous Butt Weld Pipe Mills  
Blooming Mills  
Bar and Billet Mills  
Straightening Machines  
Skelp Mills  
Uncoiler-Leveller  
Beveling and End Facing Machine  
Uncoiling Levellers  
Rotary Straightening Machines  
Shape Straightening Machines  
Cutting-Off Machines  
Tube Mill Tables  
Continuous Pipe Galvanizing Equip.  
Cooling Beds  
Tube Cold Rolling Mill

**ROLLS**

Plain Chill Rolls  
Asex Grain Rolls  
Alanite Special Rolls  
Magaloy (Nodular Iron) Rolls  
Molybdenum Rolls

**COLD DRAWING**

Piercing Mills  
Straightening Machines  
Wire Drawing Machines  
Rotary Straightening Machines  
Drawbenches  
Multi-Strand Cold Tube Rolling Mill  
Cracker Shears  
Push Pointers  
Pointers—Bars and Tubes  
Wire Pointers

**RUBBER and CHEMICAL**

Strainers  
Tilting Head Presses  
Compression Molding Presses  
Autoclave Doors  
Banbury Mixer Rebuilding  
Tire Cord Processing Equipment  
Presses  
Plastisol Casting Machines  
Cubers  
Plastic Pipe Equipment  
Extruders and Allied Equipment  
Wire and Cable Insulating Lines  
Mills—Automatic and Continuous  
Rotational Casting Equipment

**OTHERS**

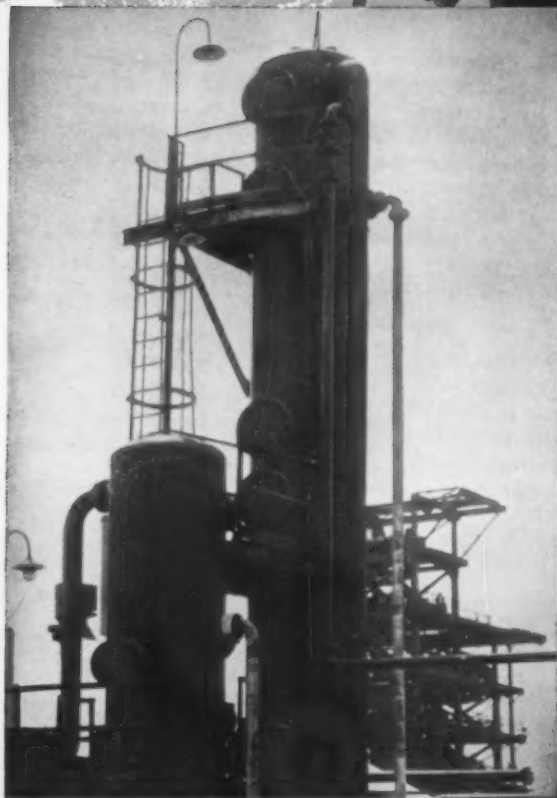
Merchant Mills  
Rod Mills  
Mill Tables  
Straightening Presses—Mechanical  
and Hydraulic

**AETNA • STANDARD**

**THE AETNA • STANDARD ENGINEERING COMPANY**

GENERAL OFFICES: PITTSBURGH, PA. • PLANTS: ELLWOOD CITY, PA., WARREN, OHIO • RESEARCH LABORATORY: AKRON, OHIO

## HAYNES Alloys solve the *tough*



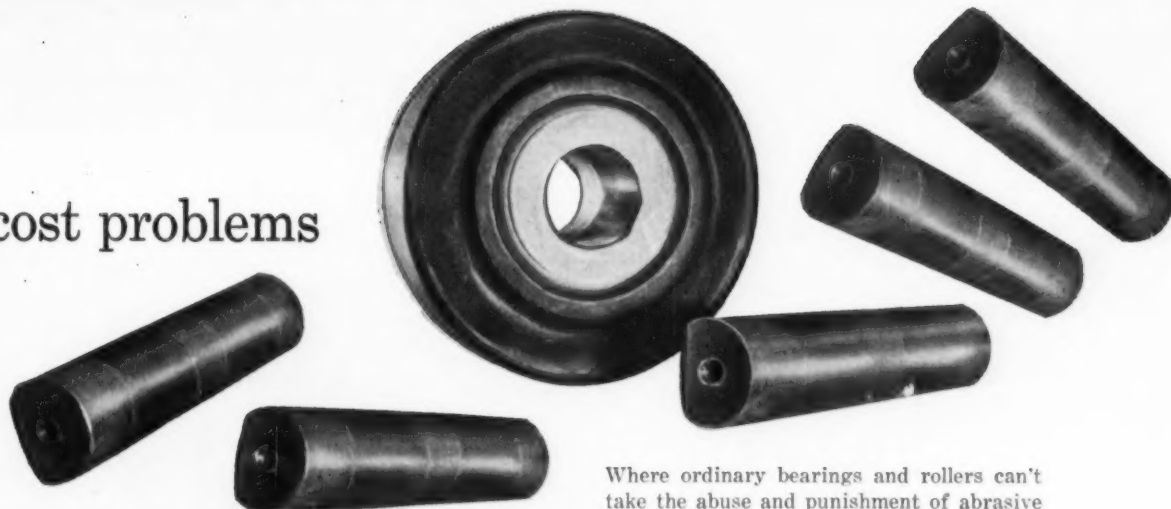
### CORROSION

HASTELLOY Alloy B has a service life 30 to 40 times that of ordinary materials while handling highly reactive hydrogen chloride gas at a chemical plant.

In petroleum, chemical, or food processing industries—wherever you find highly corrosive conditions—HAYNES Alloys are long-wearing and most economical.



cost problems

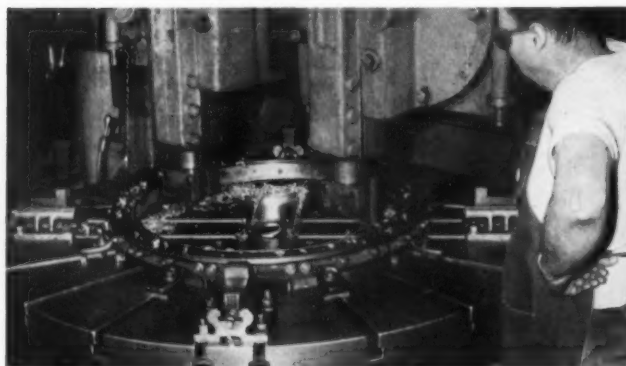


## ABRASION

Where ordinary bearings and rollers can't take the abuse and punishment of abrasive rock and acid sludge, such as in mining operations, they are hard-faced with HAYNES STELLITE Alloy No. 6 and last for years instead of weeks! HAYNES Alloys reduce maintenance and replacement costs by giving long service.

Wherever you have a *tough* cost problem due to maintenance or replacement expense caused by excessive wear, heat, or corrosion, or where there is a complex design or production problem—investigate the use of HAYNES Alloys.

In practically every industry, you will find HAYNES Alloys helping to increase production and reduce maintenance—doing an efficient job at low cost. For information on HAYNES Alloys, contact our nearest sales office or write HAYNES STELLITE COMPANY, Division of Union Carbide Corporation, General Offices and Works, Kokomo, Indiana. Sales Offices in Chicago, Cleveland, Detroit, Houston, Los Angeles, New York, and San Francisco.



## MACHINING

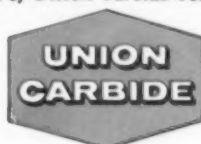
HAYNES STELLITE 98M2 alloy tools remove metal fast in machining jet engine diaphragm rings. These tools take a 1/2-in. cut and remove 55 cubic in. of metal in 15 minutes. About six rings now are machined per grind where other tools failed to finish even one. And tool service life has jumped over 600 per cent. Fast, precision machining with long tool life makes a big difference in production costs.

# HAYNES

ALLOYS

HAYNES STELLITE COMPANY

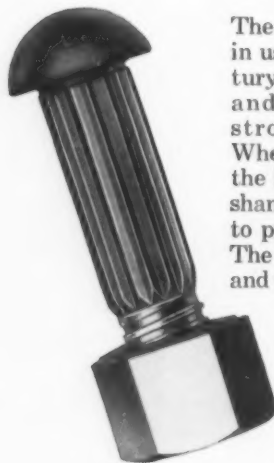
Division of Union Carbide Corporation



"Haynes," "Haynes Stellite," "Hastelloy" and "Union Carbide" are registered trade-marks of Union Carbide Corporation.

# Lamson has

## **LAMSON Dardelet Rivet Bolt**



The "original" structural bolt in use for over a quarter century. It requires only a maul and wrench to produce a strong, tight connection. When the bolt is driven into the hole, the oversize ribbed shank splines are deformed to provide a body-bound fit. The Dardelet nut is spun on and when tightened, the locking threads of the nut and bolt provide a positive locked connection that can only be backed off with a wrench. No washer is required.

These Lamson structural fasteners are distributed by 19 United States Steel Supply Division Steel Service Centers in key locations throughout the country.

# all three top performing structural bolts and nuts



## LAMSON High-Strength Structural Bolt

The A-325 and three radial marks on the head are the identification that this high-carbon structural bolt meets or exceeds rigid ASTM specifications. The "L" on the head identifies it as a genuine Lamson & Sessions bolt. Always look for these identifying marks and you'll always be sure you are getting genuine ASTM approved structural fasteners. This bolt is used with two washers and a nut made of high carbon steel to ASTM requirements.



## LAMSON Structural Nut

This is the nut that is used with both the Lamson High-Strength Bolt and the Lamson High-Tensile Bearing Bolt. The three long indented arcs on each end of the nut indicate that it meets or exceeds ASTM specifications. The short dashes inbetween the arcs identify it as a genuine Lamson nut.



## LAMSON High-Tensile Bearing Bolt \*

This new bolt assembly, made to ASTM A-325 specifications, is superior to, yet costs no more than Standard High-Tensile or Dardelet Structural assemblies. It is particularly well adapted for use in structures subject to dynamic or reversed stress loading and can be readily assembled by one man with conventional tools and equipment. It has high shear and bearing values because its knurled body fills the hole to make a joint in initial bearing. This body-bound feature, plus high strength characteristics eliminates the possibility of slip in joints and provides added rigidity and stability in the structural connection. Only one washer is required with the High-Tensile Bearing Bolt.

\* PATENT APPLIED FOR

## The Lamson & Sessions Co.

5000 Tiedeman Road • Cleveland 9, Ohio

Plants at Cleveland and Kent, Ohio • Chicago • Birmingham





# STEEL PROTECTS STEEL IN TRANSIT



Republic's Berger Division has developed and is producing steel gondola car covers to provide damage-free shipping of rolled steel in coils.

The covers afford excellent weather protection, shut out dirt, stop vandalism, eliminate costly replacement of short-lived tarpaulins. Coil users also benefit by eliminating the need for paper wrappings on coils. Another cost-saving advantage is the fact that larger coils can be shipped in specially fitted cars.

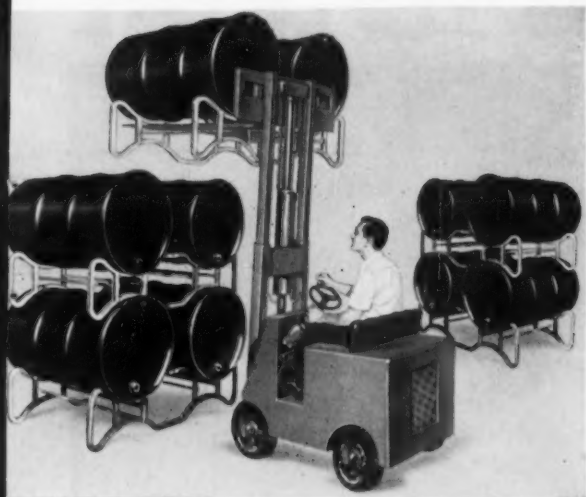
Republic Gondola Car Covers are supplied 22 feet long, 6 feet wide, and 6 feet high. Two covers are used with each 52-foot long gondola

car. The covers are easily handled by overhead or trackside crane.

Six specially designed stacking brackets are firmly attached to each cover to permit tiering during loading or unloading operations. Corrugated steel construction of the covers provides added strength, assures long service life at lowest per-year cost.

Obtain the best possible protection for rolled steel in coils and at the same time reduce your costs. Request that your coil shipments be protected by Republic Gondola Car Covers. Mail the coupon for complete information.





**NEW PORTABLE DRUM RACK. ANOTHER REPUBLIC EXCLUSIVE.**

Now, more in-use drums can be accommodated in less floor space than ever before. These steel cradles each support two loaded 55-gallon drums, permit orderly stacking of pairs of drums to any practical height. Any standard fork-lift truck can pick up, move, and stack as many tiers of drums at one time as capacity permits. Low in cost. See your Republic materials handling equipment dealer, or send coupon.

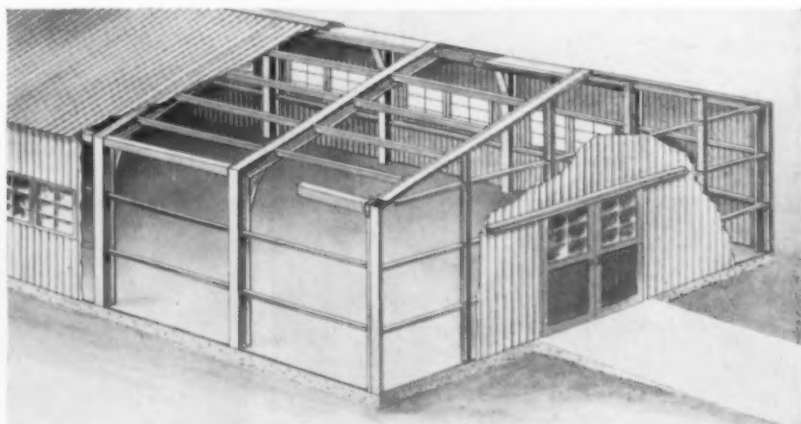


**NEW SLOTTED CONSTRUCTION ANGLE MEETS ALL YOUR FRAMING NEEDS.**

It's Republic METAL LUMBER®, Republic's Berger Division's slotted construction angle. Use this versatile, durable product for racks, catwalks, scaffolds, special purpose tables and stands. Simply plan your assembly, cut it, join with bolts. Horizontal and vertical slots on  $\frac{3}{4}$ " centers make adjustment easy. Republic METAL LUMBER is BONDERIZED and finished with baked enamel after fabrication. Comes in convenient bundles of 10 angles, in .080 gage or .104 gage, 10- or 12-foot lengths, bolts and nuts included. Stores in same space as one 2" x 4" piece of lumber. Send the coupon for catalog loaded with ideas.

**NEW COMPLETE**

**STEEL "BUDGET BUILDINGS"** are low in cost, quickly erected, reusable. These new "Budget Buildings" by Republic's Truscon Division bring the cost of additional storage space down low. Simplified design permits fast on-site erection. No painting needed. Siding, roofing, doors, windows, hardware all included. Immediate delivery in widths 32, 36, 40, 44, and 48 feet . . . 12- and 14-foot heights. Lengths as long as you want them. Send coupon for bulletin covering complete facts.



# REPUBLIC STEEL



*World's Widest Range  
of Standard Steels and  
Steel Products*

**REPUBLIC STEEL CORPORATION**

DEPT. IA-6375

1441 REPUBLIC BUILDING • CLEVELAND 1, OHIO

Send more information on:

- |  |   |
|--|---|
| <input type="checkbox"/> Gondola Car Covers    | <input type="checkbox"/> Portable Drum Racks        |
| <input type="checkbox"/> Republic METAL LUMBER | <input type="checkbox"/> Truscon "Budget Buildings" |

Name \_\_\_\_\_ Title \_\_\_\_\_

Company \_\_\_\_\_

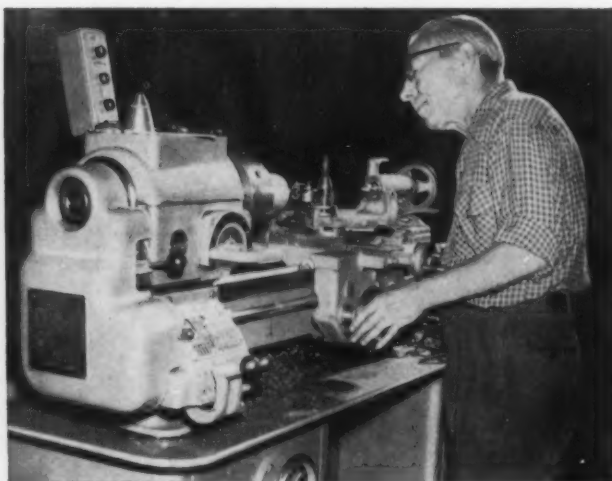
Address \_\_\_\_\_

City \_\_\_\_\_ Zone \_\_\_\_\_ State \_\_\_\_\_

# DELTA INDUSTRIAL

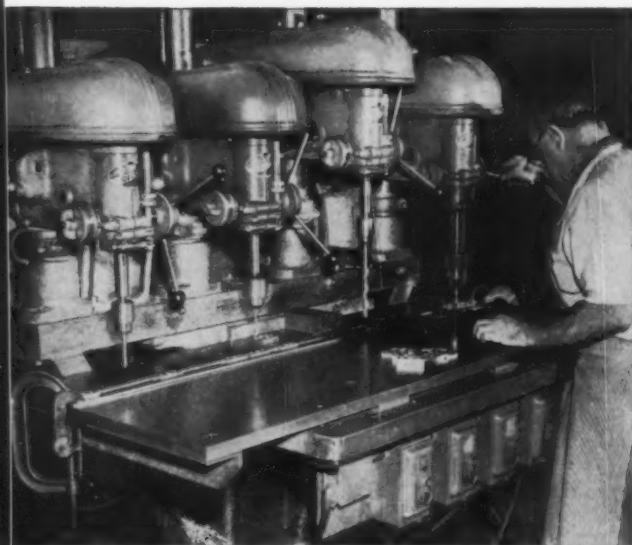


**DELTA 20" DRILL PRESSES** are built to give you machine tool production capacity with power tool flexibility. Massive construction and rugged power make the Delta 20" a heavy-duty tool. Available with hand or power feed, choice of No. 2 or No. 3 Morse taper spindle. 28 models include floor, bench, multiple spindle and overhead types. Production tables, heads and columns available as components.



**DELTA 11" METAL LATHES** offer exclusive Delta Quality features such as massive head stock construction, perfected variable speed drive, unique 4-position drive selector and many more. Both 4 ft. and 5 ft. bed models available with flame hardened bed. And you get the double versatility of a ram-type turret lathe, when you add production accessories for precision multiple machining jobs.

## A proved way to cut your costs

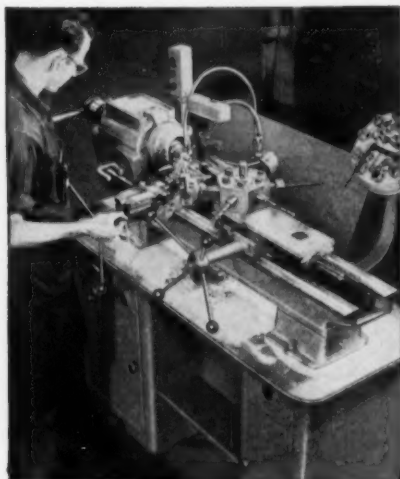


**DELTA 17" DRILL PRESSES** in over 70 models enable you to make your own single or multiple spindle set-up for drilling, counterboring, reaming and tapping jobs. Finest in their class, they are engineered for precision work and built for long life with low maintenance costs. Standard or power feed, high or slow speed and key chuck or tapered spindle available in floor, bench and multiple spindle models.



**DELTA CUT-OFF MACHINES** for fast, smooth, accurate cuts are speeding production and improving quality in tool rooms, maintenance departments and on production lines. Work head pivots for easy mitering. All belts, pulleys, cutting wheels or blades are fully enclosed for maximum safety. Whether you do wet abrasive or dry abrasive cutting, or cut non-ferrous metals or wood—you choose the model that's right for your job.

# PRODUCTION TOOLING



**DELTA HAND SCREW MACHINES** fill the production gap between standard engine lathes and expensive, automatic screw machines . . . and at lower cost than any comparable machine. Bed turret, double tool post cross slide and lever type collet closer are standard equipment. Delta Quality features throughout assure lasting precision on multiple machining jobs.



**DELTA TOOLMAKER GRINDERS** perform three precision grinding operations—surface, chip breaker and tool and cutter grinding. And with Delta 6" tool grinders, 7" standard grinders and 2½" belt grinders you have a complete line of safe, accurate, low cost grinders for every shop need.



**DELTA 14" BAND SAWS** These versatile, low cost machines give you eight cutting speeds—ranging from 40 fpm for metal to 3000 fpm for wood—using a standard motor. They enable you to cut stainless steel, armor plate, high speed steel, cast iron, alloy steel and dozens of other materials including woods and plastics. Available with steel or cast iron stand.

## on every metalworking job



**DELTA 15" DRILL PRESSES** offer such Delta exclusives as six spindle adapters, "universal" hand feed, counter-balanced belt guard . . . plus big, machine tool ruggedness and proven production dependability. Delta 14" utility and 14" Super-Hi Sensitive Drill Presses also available in many models.

Thousands of metalworking plants across the country are cutting costs by using Delta Industrial Tools to supplement or replace expensive, special-purpose machines. Here's why: Delta tools are ruggedly built to withstand hard, continuous wear—they offer precision performance to meet the highest production standards—yet they cost less to buy, less to operate, and less to maintain. Completely portable, Delta tools can be moved in and out of production lines to relieve bottlenecks. And any plant can have inexpensive, automated operations through the combination of versatile, standard Delta components and automatic control devices.

Because Delta is the world's most *complete* line, you can choose the *right* tools for the biggest savings on *your* jobs.

Get all the facts on how *YOU* can cut costs with Delta Industrial Production Tooling. Write for *FREE* Delta Industrial Catalog to: Rockwell Manufacturing Co., Delta Power Tool Div., 640J N. Lexington Ave., Pittsburgh 8, Pa.

See Delta Industrial Tools at your nearest Delta Dealer . . . he's listed under "TOOLS" in the Yellow Pages.

DELTA INDUSTRIAL TOOLS

another fine product by

**ROCKWELL**



# integrated CRUCIBLE steel service



Crucible inside account salesmen (1) simplify ordering and expedite deliveries of the steels you need,

(2) arrange for handling extra services, (3) supply you with basic steel and metalworking data.



# staffs 27 local warehouses with specialized personnel to solve your specialty steel problems

"We frequently rely on Crucible warehouse people," says one of our good customers. "We've found they can sometimes show us more economical steels, sizes and methods than those we're using. Furthermore, they give us valuable help with steels we're using for the first time."

This steel buyer, like thousands of others, believes in getting services with the steels he buys. Here's what he gets:

Crucible inside account salesmen help him simplify ordering, speed up his deliveries. They can efficiently arrange for extra services, such as forging, slitting, grinding and polishing, because of their special training at Crucible mills.

Crucible sales-service engineers give their production and toolroom people valuable metalworking assistance. They'll recommend machining speeds and feeds, quenching temperatures, the best forming and joining methods.

Behind these specialists are the resources of Crucible's entire, integrated operation — from mining the ore to steelmaking to warehouse delivery to you. Why not take advantage of these services each time you order specialty steels? They're available through every Crucible warehouse. *Crucible Steel Company of America, Dept. P106, The Oliver Building, Mellon Square, Pittsburgh 22, Pa.*

## STOCK LIST

Keeps you up-to-date on local stocks of specialty steels. Just ask the Crucible salesman to place your name on the regular mailing list.

One Source  
For All  
These Steels



Need certified test reports for government work? Warehouses can supply the steels and notarized reports of analyses.



Trained, experienced sales-service engineers can help your engineers use steels that are new to you.



This is the easiest way to arrange for forging, flame-cutting — have the warehouse accommodations service do it for you.

**TOOL STEELS**—Water, oil, air hardening, shock resisting, hot work, plastic and die casting steels in all forms, including bars, sheets, plates, drill rod, hollow bars, forgings and flat ground stocks

**HIGH SPEED STEELS**—Crucible's famous "Rex"® steels: Rex Thrift Finish rounds, hot rolled and cold drawn flats and squares, drill rod, forgings, sheets, plates, and tool bits

**STAINLESS STEELS**—Bars, sheet, strip, wire, cold heading wire, metalizing wire, plates, angles

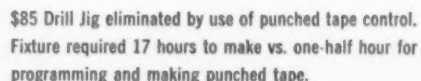
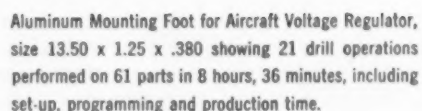
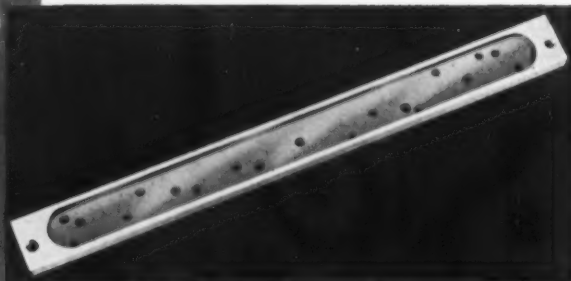
**FREE MACHINING STEELS**—Crucible Max-el® rounds, hexagons, plates and brake die steel  
**ALLOY STEELS**—Bars, billets, strip and sheet  
**COLD ROLLED CARBON SPRING STEELS**  
**DRILL STEELS**—Hollow and solid drill steels  
**ALUMINUM EXTRUSION DIE STEELS**  
**HOLLOW TOOL STEEL**  
**WELDING AND HARD FACING ROD**  
**PLASTIC MOLD STEELS**  
**PERMANENT MAGNETS**

— and many others

## CRUCIBLE STEEL COMPANY OF AMERICA

Branch Offices and Warehouses: Atlanta • Baltimore • Boston • Buffalo • Charlotte • Chicago • Cincinnati • Cleveland • Columbus • Dallas • Dayton • Denver • Detroit • Grand Rapids • Harrison • Houston • Indianapolis • Kansas City • Los Angeles • Milwaukee • New Haven • New York • Philadelphia • Pittsburgh • Portland, Ore. • Providence • Rockford • Salt Lake City • San Francisco • Seattle • Springfield, Mass. • St. Louis • St. Paul • Syracuse • Tampa • Toledo • Toronto, Ont.

# BURGMASER G.E. Tape



**2BHT-3BHT Automatic  
Tape Controlled  
3/4" and 1 1/2" Capacity**

**Time Reduced 68% — \$85 Drill Jig Eliminated**

(AT G.E., WAYNESBORO, VA.)

# Controlled Turret Drill

( $\frac{3}{4}$ " DIAMETER CAPACITY IN STEEL)

## with automatic numerically table positioning control

Total programming for this part was one-half hour vs. jig making time of 17 hours and the total production time of 61 parts was cut from 26 hours, 24 minutes to 8 hours, 36 minutes—a savings of 68%.

Important is the fact that small lots can be efficiently machined with inexpensive holding clamps to effect even greater savings. Short set-up time permits the Burgmaster to be used on a multiplicity of parts with standard or inexpensive tools. Furthermore, punched tapes can be stored indefinitely for future use—duplicate tapes can be made in seconds—and in case of design changes, new instructions can be typed in at any point.

### Maximum Flexible Automation

The application of G.E. Numerical Controls to either Standard Burgmaster 6-spindle or 8-spindle turret drilling, tapping and boring machines results in maximum flexible automation. That is, these field proven Burgmaster machines can be quickly and economically set up to produce a large variety of parts using standard tools and simple holding clamps. The

#### Programming and Tape Preparation

Manufacturing personnel transpose drawing decimal dimensions to a program sheet including feeds, speeds, spindle sequence, and any auxiliary functions. A typist then prepares the standard eight-hole punched tapes in a matter of minutes and checks it for accuracy from a typed tape produced at the same time. Duplicate tapes can be produced in seconds, and new instructions (representing design changes) can be typed in at any point.



standard Burgmaster hydraulic controls are maintained... including pre-selective spindle speeds, infinitely variable pre-selective feeds, selective rapid approach and return, skip indexing, precision depth control, and simple manual controls for set-up. The G.E. numerical system controls all machine functions, selects spindles in any sequence, automatically positions the table on two axes, clamps the table while machining operations are performed, and controls coolant. Up to six operations can be performed at any command position without moving the table. All operations are carried out at their most efficient rate for high finish, precision, speed, and longest tool life. As a result one man can operate two or more machines on many jobs, or by attaching two tapes together one part can be machined on one end of the table while work is being set up on the other to effect constant machine operation.

Why not get all the facts on your work. There is a Burg direct representative or dealer near you... call him... there is no obligation.

### JOB FACTS:

**Machine:** Burgmaster 2BH-T 6-Spindle Turret Drilling, Tapping and Boring Machine

**Control:** G.E. Numerical Control  
**Part:** Aircraft Mounting Feet for Voltage Regulator

**Material:** 52 S A1.

**Quantity:** 7 lots of 61 each—total 427 parts

**Holding:** Two Universal finger clamps and 1" Spacer Bar

**Accuracy Required:** .003" Hole Dia.  
 $\pm .005$  Hole Position

Operations	Speed	Feed
#1 Center Drill	1250	.004
#2 9/32 Drill (.281")	1000	.008
#3 #6 Drill (.204")	1250	.005
#4 #10 Drill (.193)	1330	.004
#5 9/64 Drill (.140)	2000	.005

**Former Method:** Six Spindle Drill Press  
Special Drill Jig—17 hours to make  
Set-up—3 hours, 24 minutes

**Total Production Time:**  
26 hours, 24 minutes

#### Present Method:

Set-up—2 hours, 25 minutes  
Programming Time: 20 minutes  
Proof-read Tape: 10 minutes

**Total Production Time:**  
8 hours, 36 minutes

#### Savings:

Eliminate \$85 Jig  
Program Time of One-half Hour  
vs. Jig Making of 17 hours.  
Set-up and Production Time  
Reduced 17 hours, 38 minutes  
or 68%.

Write for Bulletin describing Burgmaster 6 and 8 Spindle Tape Controlled Turret Drilling, Tapping, and Boring Machines. 30-minute 16mm sound film showing all Burgmaster Turret Drills in operation is available from any office without charge.

## BURG TOOL

MANUFACTURING COMPANY, INC.

15001 South Figueroa Street, Gardena, California

Tel. FAculity 1-3510, TWX—Compton, California 6011



#### BURGMASER DIRECT SALES OFFICES:

**NEW JERSEY:** BURGMASER EASTERN SALES DIV., 86 N. Maple, Ridgewood, N.J., Ph. GI. 4-3002, TWX—Ridgewood, N.J. 724

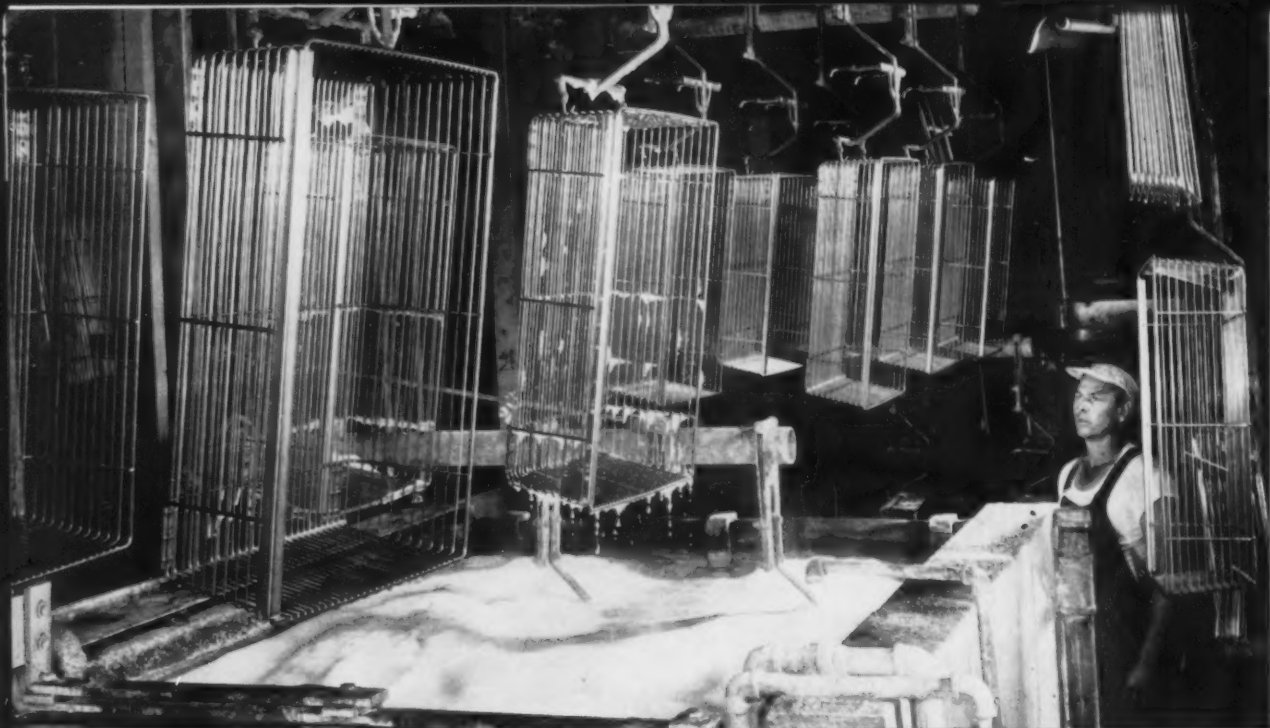
**CHICAGO:** BURGMASER MACHINERY, INC., 5329 Lincoln, Chicago 25, Ill. Ph. Long Beach 1-1178, TWX—CG 3353

**CLEVELAND:** BURGMASER OHIO SALES DIV., 14706 Detroit Ave., Cleveland 7, Ohio, Ph. AC 6-3700

**DETROIT:** BURGMASER MICHIGAN SALES DIV., 13730 W. 8 Mile Rd., Detroit 37, Mich., LI. 8-4333

**SAN FRANCISCO BAY AREA:** WALT COOPER, 1341 Old Country Rd., Belmont, Calif., Tel. LYtell 1-0309

Plus dealer representatives in other industrial centers.



**Baskets for a combination refrigerator-freezer enter plating line on conveyor. They are shown here leaving the first bath, an alkaline cleaner, and moving to a clear water rinse. A total of 15 immersions are given these baskets in the**

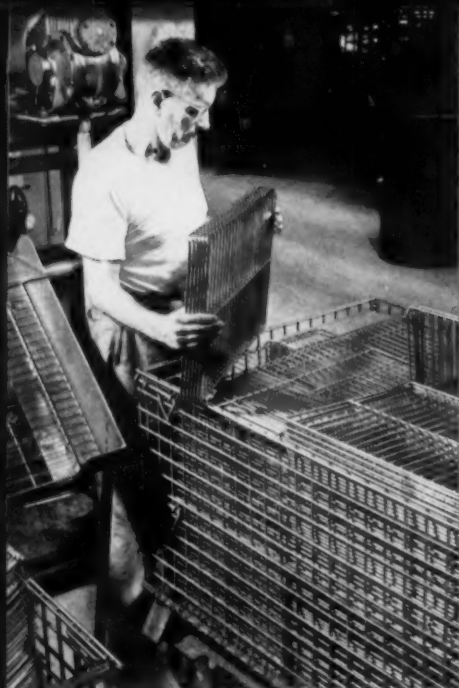
**process of plating them with a .0005 inch coating of zinc. Below: The excellent surface required for plating is shown in the Pittsburgh Steel wire stockpiled at Bauer Bros. Co. in its Springfield, Ohio, wire division.**

## **Bauer Bros. Gets Extra Clean Wire For Fully Automated Plating Lines**

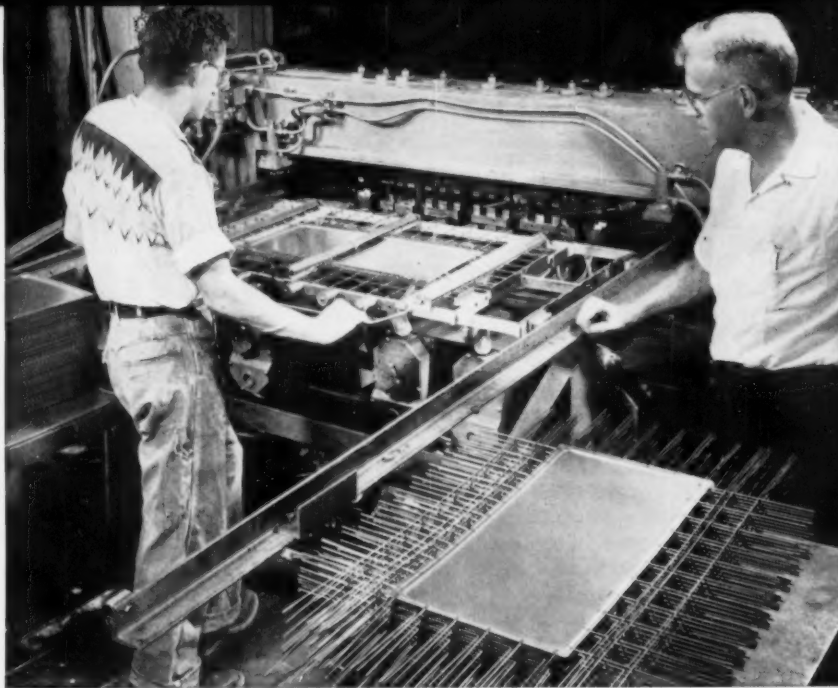
**Defect-free Finish of Pittsburgh Steel Co. Wire  
Eliminates Costly Surface Preparation**







This machine was designed and built by Bauer Bros. own personnel to speed the efficient production of racks, seen here coming off the end of the unit.



On this automatic multi-welder, design-specified by William Cannell, right, Bauer Bros. Co. master mechanic, a total of 288 different combinations of welds can be made. Here the operator is welding wire to a solid bottom basket for use by a major appliance manufacturer.

**Bauer Bros. Co. demands, and gets, from Pittsburgh Steel Company extra smooth, clean, bright wire which can go into plating lines without any expensive surface preparation.**

This is only possible with wire that has an extremely clean, defect-free surface.

Bauer Bros. Co. keeps its Springfield, Ohio, plant's automated plating line running smoothly with consistently excellent results.

The Wire Division of Bauer Bros. Co. fabricates wire shelves, racks and baskets for refrigerators, freezers, ovens and other appliances made by virtually every major appliance manufacturer.

Bauer Bros. buys coils of wire which it cuts into proper lengths, straightens and then forms into finished products on automatic shaping and welding machines, many of which were designed by Bauer Bros. personnel.

On these machines, Pittsburgh Steel's bright basic wire gets its first test. Good grain structure gives the wire ability to take severe bending without ripping or tearing. Uniform hardness from coil to coil and from shipment to shipment speeds production and holds down rejects.

**• Meets Customer's Demands—**

On a completely automated plating line, Pittsburgh Steel wire meets Bauer Bros. demands for freedom from pits, seams and porosity.

So, Pittsburgh Steel wire helps

Bauer Bros. Co. two ways:

**1. More economical production** on automatic machines and on plating lines.

**2. Improved appearance** of the final product adds to salability.

Bauer Bros. Co. can plate its wire products with any of these coatings:

A combination of copper, nickel and chrome; zinc, clear or colored lacquer, and plastic (the new Corvel Fusion Bond process).

Products come to the plating line on an overhead conveyor directly from the Fabrication Department. Without any stops, the conveyor immerses products in a series of tanks on the plating line. In zinc plating, pictured here, baskets are dipped in a total of 15 tanks without a halt and without the intervention of a human hand. Drying and baking complete the plating cycle.

On these baskets, destined for use in a new combination refrigerator-freezer made by one of the country's largest appliance manufacturers, the zinc coating never falls below .0005 inch.

After plating, coatings are laboratory checked for porosity, density and resistance to wear and corrosion. In one test, products are enclosed in a salt air immersion chamber where temperature is maintained at 100 degrees F. and humidity at a sweltering 100 percent. A five percent salt solution gives the zinc a rugged workout.

**Standards like these, rigidly maintained, call for the best in wire. The wire must be the ultimate in cleanliness, smoothness and uniformity. Pittsburgh Steel wire meets these specifications day in and day out.**

Like Bauer Bros. Co., you also can get production economies and a more salable product from the use of Pittsburgh Steel's basic wire. Whatever you make from any type of manufacturers wire—from nails to precision springs—let a Pittsburgh Steel representative show you what Pittsburgh Steel quality and service can do for you. You can start benefiting today by getting in touch with the nearest district sales office.

## Pittsburgh Steel Company

Grant Building

Pittsburgh 30, Pa.



**District Sales Offices**

Atlanta  
Chicago

Cleveland  
Dallas

Dayton  
Detroit  
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Los Angeles  
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Warren, Ohio

## Newly designed Type H Motor Control

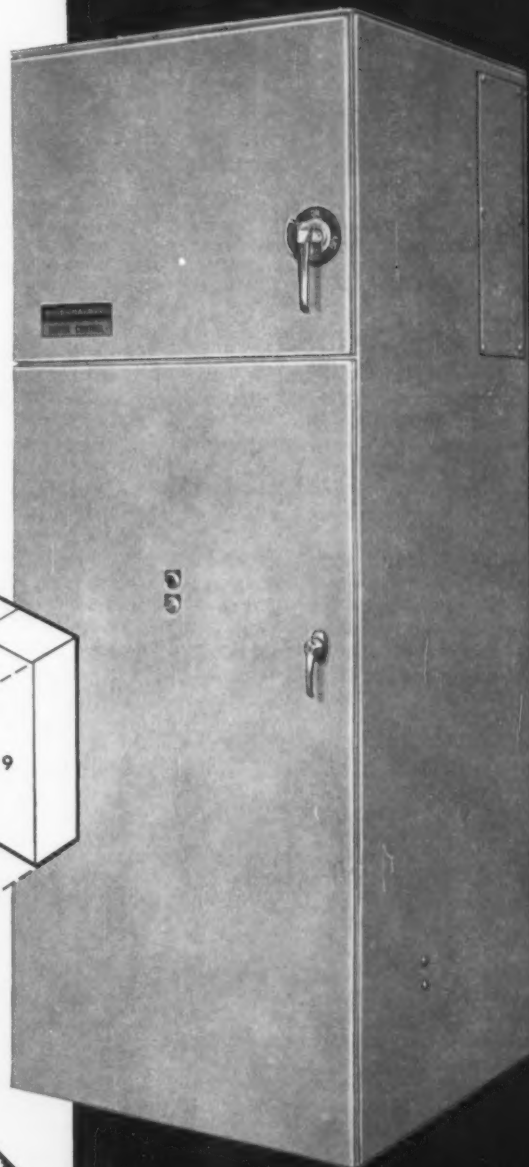


# Saves valuable plant space

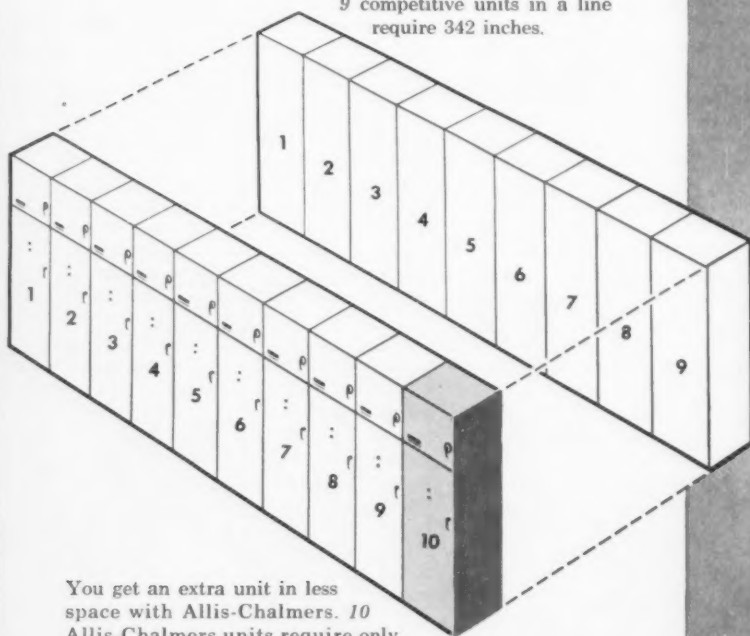
Newly designed Allis-Chalmers high voltage control units are only 34 inches wide. This means you can put 10 Allis-Chalmers cabinets in less space than required by 9 competitive 38-inch units. In addition, the narrower width means less space required for door swing. Result: You save a total of 2.36 sq ft of floor space per unit. On 10 units, this means a saving of 23.6 sq ft.

Smaller size is only one of many advantages in this new Allis-Chalmers design. You also get full-front access, more room for optional features, a completely tested unit, and the ultimate in protection for men and machines.

For more information on how this new control design can help you, call your nearest Allis-Chalmers representative, or write Allis-Chalmers, General Products Division, Milwaukee 1, Wisconsin.



9 competitive units in a line  
require 342 inches.



You get an extra unit in less  
space with Allis-Chalmers. 10  
Allis-Chalmers units require only  
340 inches.

# ALLIS-CHALMERS



A-5518

## Tannins for Steel Protection

Not only does a new tannin-phosphoric acid solution leave a protective iron phosphate coating on steel surfaces, but its tannin content combats bacterial corrosion. Suggested uses for the treatment are on all cast and mild steel pipelines and steelwork subject to constant dampness underground.

## How to Speed Steel Orders

Electronic order processing is getting a strong push from steel mills. Programs now underway aim at using computers for production planning, production scheduling, quality control and accounting functions. Mill teams are out determining what data is needed. Computer makers are working out processing routines.

## Missile Lineup to Change

A thorough re-evaluation of the missile program now going on in the Pentagon will probably bring significant changes. New developments may cause replacement of some missiles that now look important in the defense picture. Some idea of what's ahead should emerge in October when the services start determining their programs for fiscal 1960.

## Comment on Recovery

The economic upturn is underway and will continue at least through 1959. Mellon Bank's James N. Land gave this word to Pittsburgh purchasing agents last week. One of the first to spot the recent recession, Mr. Land said the bottom was hit in April and things have been improving ever since.

## Rough Road for Small Firms

Small firms trying to enter the missile and rocket business complain that many of their designs are being "stolen" by the Pentagon. They design and develop an item, only to have the services turn the design over to a pet major

contractor for production. Figures show small firms get only about half the business set aside for them and only about 6.4 pct of total spending.

## Columbium for Hot Spots

Several metalproducing and metalworking firms are developing Columbium-based high temperature alloys. Some of these employ 90 pct or more Cb. Principal applications would be in the hot spots of jet engines and missiles.

## Pyrometer Scans Surfaces

A high-speed instrument remotely scans a distant surface and presents a temperature profile on a cathode ray oscilloscope. The unit, sensitive to temperatures from 50° to 1000°C, permits improved methods of remote inspection and quality control. One use: location of hot spots on rotating tires and rapidly moving films.

## Galvanize Tubing in Line

Although not yet in the announcement stage, a new continuous process turns out galvanized seamless tubing. Tubing proceeds directly from tubing mill through pickling to spray galvanizing steps.

## A Look at Electron Welding

Electron welding was demonstrated recently at the industrial lab of a major electrical manufacturer. Research engineers say the process will weld, melt, drill and machine rare metals of high purity. They've even welded metals to ceramics. So far the technique is experimental, although they've done some jobs for atomic energy plants that were impossible otherwise.

## X-Rays Study Auto Tires

X-rays are being used to detect flaws and check structural characteristics of vehicle tires. Previously, tires were cut apart for checks, and flaws were often missed. X-rays also permit study of the inside of tires while they are under load.

*New—from Timken Company Research...*

# TBS 600

**a thru-hardening steel**

# CBS 600

**a carburizing steel**

**...for bearing and aircraft use  
at temperatures up to 600°F.**

**T**O meet the increasing temperatures of jet and rocket craft, The Timken Roller Bearing Company has developed two new low alloy steels with high recovered hardness and good resistance to tempering for operation up to 600°F. These steels are especially suited to anti-friction bearings as well as other aircraft and missile uses. They have been thoroughly tested under simulated service conditions and are available in the form of seamless tubing, bar stock, bars and billets, and ball or roller wire.

**The thru-hardening steel**—Timken TBS 600 steel—has a recovered hardness of 59 Rockwell C measured at room temperature after holding 500 hours at 600°F.

Hot hardness at 600°F. is 56 Rockwell C which is extremely high for a low alloy steel.

**The carburizing steel**—Timken CBS 600 steel—exhibits a hot hardness of 56 Rockwell C and a recovered hardness of 61 after 500 hours at 600°F., at the 1% carbon level. Corresponding hardness for the core is 55 and 58 Rockwell C. Both steels contain less than 5% alloying elements.

TBS 600 and CBS 600 can be machined and heat treated in practically the same way as their normally used counterparts. For more information call or write: The Timken Roller Bearing Company, Steel and Tube Division, Canton 6, Ohio. Cable address: "TIMROSCO".

# TIMKEN *Fine Alloy* STEEL

TRADE-MARK REG. U.S. PAT. OFF.

**SPECIALISTS IN FINE ALLOY STEELS, GRAPHITIC TOOL STEELS AND SEAMLESS STEEL TUBING**



# Steel Labor Closes Ranks: Tough Bargaining Ahead in '59

**Union convention backs McDonald and beats down rebellion over dues.**

**Labor will set a high price for continued labor peace when contract talks begin next year.**

**There could be a strike—By Tom Campbell and J. B. Delaney.**

■ David J. McDonald still "owns" the United Steelworkers of America.

Open opposition to Mr. McDonald's reign as president of the steel union vanished last week when the so-called "Dues Protest" insurgents went down to defeat at the union's ninth constitutional convention in Atlantic City.

**No Chance For Rebels** — The rebellion headed by Donald C. Rarick, a Pittsburgh district mill worker, was an outgrowth of the union's 1956 convention, where monthly dues were raised from \$3 to \$5 per month. Rarick charged the dues rise was railroaded through the convention. He later ran against McDonald for the union's presidency and polled a surprising 230,000 votes against the incumbent's 400,000. Apparently, Rarick's cause went downhill from that time on. He didn't have a chance at last week's convention.

Now that he is firmly established as top man in the union, Mr. McDonald can be expected to pursue his customary tough bargaining tactics when he negotiates new contracts with steel companies in 1959. Present contracts, negotiated in 1956, will expire next July 1.

**Odds Favor '59 Strike**—There's little doubt that next year's bargain-



**TIME OUT:** Dave McDonald, president of the United Steelworkers, and one of his "brain trust" members, Arthur Goldberg, discuss a point during a lull at the union's convention in Atlantic City last week.

ing will be the toughest in the union's history. Mr. McDonald will be under the usual pressure for "more of the same." Steel firms

will be just as tough against making concessions that would force another increase in steel prices and the usual hue and cry that goes

with it, justified or not.

At the present time, The IRON AGE figures it's at least a 65-35 bet that there will be a steel strike next year. It could be a long and bitter one.

#### **Trouble Ahead**—Here's why:

1. The steel market is gaining strength after about a year of recession. By the time contract bargaining starts, the industry should be well out of the woods from a market standpoint. Steel labor will demand its share of steel earnings.

2. Mr. McDonald will be given pretty much of a free hand in getting everything he can for the membership. His concern over the effect of automation on mill employment indicates that the so-called short work week will be one of his objectives. He'll try to improve on virtually all economic aspects of the contract, and could make a fight for changes in grievance machinery on the ground that hundreds of grievances have been going unsettled over long periods of time.

3. The mills are up against it to call a halt to the perennial wage increases and price boosts. While their customers cried the least over this year's price hike, some of the important ones are pressing the mills to put up a fight next year.

**Both Want Peace**—Neither side wants a strike, and the chances are there will be plenty of give-and-take around the conference table in the hope of avoiding one. Still, it will be hard to come up with a contract that would not require another price boost by the steel firms. Mr. McDonald will be out to get the best possible contract.

The steel companies will have to play the negotiations by ear, regardless of how much advance planning is made. Pre-negotiation pressures from steel users usually demand that steel firms make a fight of it—even take a strike. But once a strike is underway, the pressures tend to reverse themselves, say steel people. Then it's: "Settle at any cost."

**Delegates Sore**—The temper of

delegates to this year's steel union convention was one of the meanest in years. They were sore as a boil over a story published in Fortune magazine to the effect that Dave McDonald was all washed up and would resign at the convention. They were sorer still at Rarick and his crowd for attempting to embarrass the union leadership. It was a strain for McDonald and other union leaders to keep order.

Mr. McDonald leaned over backward to avoid any charge that the insurgents were not given an opportunity to plead their cause.

**Rebels Face Expulsion** — As it turned out this was good strategy. The rebels proceeded to hang themselves. Delegates voted down every move of the insurgents and finally set up the machinery for trying the dissidents before their own local unions on charges of dual unionism. This is a term used to describe a group accused of trying to wreck the union. The insurgents could be expelled, depending on outcome of the local union trials.

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## The Ford Auto Labor Settlement

**Pattern Setter** — The agreement between the United Auto Workers and Ford Motor Co. is expected to set the economic pattern for the rest of the auto industry.

Terms of the contract are nearly identical to those which expired June 1, with the addition of improvements in Supplemental Unemployment Benefits, pensions, and skilled trades wages. The one big new feature to auto industry contracts is severance pay.

**Cheap Contract**—Neglecting cost-of-living payments and improvement factor charges, additional costs are only about 2-2.5¢ per year, making it the cheapest contract an automaker has been able to swing in years. The total three-year package, excluding escalation, is in the neighborhood of 27¢ to 30¢.

Here are principal contract provisions:

**SUB Extended** — Supplemental Unemployment Benefits are extended to cover 39 weeks of unemployment in states providing coverage this long, at a straight 65 pct of regular take-home pay. This includes regular unemployment compensation benefits. Maximum SUB payment is raised to \$30 per week.

A short workweek benefit provision is added. It provides for supplementing income up to 65 pct of straight time take-home pay in weeks in which the employee's earnings are too high for him to qualify for state compensation.

**C-of-L Continued**—Annual improvement factor of 2.5 pct of base hourly rate or six cents an hour, whichever is greater, is continued. Average increase is about seven cents an hour. Effective dates are July 1, 1958—making it retroactive—Aug. 1, 1959, and Sept. 1, 1960.

Cost-of-living allowance is continued. The 2-cent increase employees would have received last June 1 will be paid retroactive to July 1, and the 1-cent increase due on Sept. 1 will be carried back to that date. The 3-cent c-o-l had raised current payments to 25¢ per hour. However, 15¢ of this has been added to the employees base rates, raising improvement factor costs, and reduces charges to 10¢. At the same time it raises Ford's base rate average to about \$2.62 per hour, from \$2.52.

**Skilled Worker Bonus**—Workers in certain skilled trades classifications will receive an additional 8¢ per hour, effective Sept. 1. This is over and above the improvement factor. It will go to tool and die, maintenance, construction, and power house groups. Added cost: Under one cent.



**MACHINERY:** Orders in 1959 won't be just written—they will have to be sold says Bliss Co.'s Burgoyne.



**STEEL:** Finished steel demand of 75 million tons . . . operations at 75 pct are predicted by Armco's Johnston.



**CONSTRUCTION:** Volume in '59 only slightly larger than '58 forecast by Turner Construction's Turner.

## Sales Comeback Forecast for '59

**Most industries will find the sales climate better next year, speakers at marketing conference predict.**

**Armco's Johnston expects steel output to increase about 25 pct over 1958.—By P. J. Cathey.**

■ Industrial sales charts will move upward in 1959. For some industries the gains will be limited, for others they will be large.

That's the opinion of leading industrialists who surveyed the sales outlook for 1959 during the recent 6th Annual Marketing Conference of the National Industrial Conference Board.

**Advances for Steel**—Improved steel sales will make possible an average operating rate of 75 pct next year, Logan T. Johnston, executive vice president of Armco Steel Corp. told listeners. Based on this he predicted "a steel ingot production in 1959 of about 108 million tons . . . an increase of

about 25 pct over this year's level of production."

Steel production dropped 38 pct during the recession, Mr. Johnston pointed out, but "the balance has now shifted to the side of recovery." Steel's 1959 gains will come as business improves for the industry's leading users. He made these sales forecasts for steel consuming industries:

**Automotive:** "Production of at least 5.3 million cars and a million trucks during 1959 . . . an improvement of about 1 million cars and 150,000 trucks over this year's expected output."

**Construction:** "Volume should hit \$35.3 billion in 1958 . . . Next year will be even better, except for a lag in industrial construction. We expect a gain of about 3 pct in construction volume in '59."

**Machinery:** ". . . Has shown some improvement in the last two months. . . we look for a gain of about 5 pct in machinery output next year."

**Railroads:** "Steel demand from railroads should be up at least 15 pct in 1959."

**Petroleum:** "The industry has largely worked out of a troublesome inventory position . . . in both petroleum products and in steel used by this industry."

**Containers:** "Demand for steel is expected to rise 4 or 5 pct next year."

**Less Industrial Building**—Limited construction gains in '59 were seen by H. C. Turner, Jr., president of Turner Construction Co. "Total construction volume next year," he said, "will be only slightly larger than that of 1958."

**Hard Sell for Tools**—Machinery's major market next year will be in replacement, according to Albert S. Burgoyne, vice president of manufacturing, E. W. Bliss Co. "Projected results estimate 1958 orders will be about 15 pct below 1957 levels," Mr. Burgoyne said. "In 1959, a year of partial recovery, orders will be only 8 pct below '57 levels."

# Experts Look at the Space Age

## They See Many Changes Ahead for Metalworking

**What will the space age mean to the metalworking industry?**

**This question was asked by IRON AGE editors at a meeting of the American Rocket Society last week.**

**Here are the replies.**

■ Technological changes brought on by the space age will affect every industry. In the years ahead there will be greater demand for research and development work. But there will be no mass production of space vehicles.

These were recurring opinions expressed by industry and military leaders in Detroit last week for the fall meeting of the American Rocket Society.

**Effect on Employment**—George P. Sutton, manager of advance design for Rocketdyne Div., North American Aviation, Inc., and president of the Rocket Society, foresees no great boost for the metalworking industry in projects under development or planned. "These developments will not appreciatively increase employment," he says.

K. J. Bossart, assistant to the

vice-president of Convair Astronautics, agrees. "Design offices and test labs will expand at the expense of manufacturing facilities, and the proportion of engineering personnel will increase greatly with respect to the head-count of manual labor. Capital expenditures will grow to the point of becoming the lion's share of manufacturing costs," he says.

**Others to Benefit**—But the space age is not expected to be without its benefits for metalworking firms not actually sharing in projects.

With this country committed to a space program, the government people most closely associated with it forecast a great impact on industry, far beyond the immediate dollars involved.

**New Markets Coming**—Dr. Richard S. Cesaro, of the Advanced Research Projects Agency, Dept. of Defense, says: "Certainly the direct expenditures by the government will have an immediate return to the industry, but more important, the by-products will open up totally new industrial markets and will result in the greatest impact to industry."

Dr. George E. Valley, Jr., chief scientist for the Air Force, believes the by-products of space travel developments will find applications in all walks of life. "As I see it," Dr. Valley says, "industry will profit most from the indirect results of space research which will very likely result in discoveries applicable and exploitable in devices useful for other than space flight itself."

In direct procurement, also, the new program will bring into the metalworking field more dollars. But many of the scientists and engineers here caution that actual manufacturing activities are limited in numbers, depending more on quality of product than quantity.

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## When the Space Age Arrives

Some day the era of space travel will be here. Its impact upon industry will be at least as great as the steam engine, the electric motor, the automobile, the airplane, radio and television, and the atom. Here are some areas in which industry can expect to see major change:

### **Research and Development**

More intensive design, development, and testing of components and systems.

Expanded research laboratories, test facilities, and larger capital expenditures.

### **Management**

Greater emphasis on management, scientific, and engineering personnel; minimizing of production functions.

Short term industry combinations for specific programs, subcontracting between competitive firms.

### **Engineering**

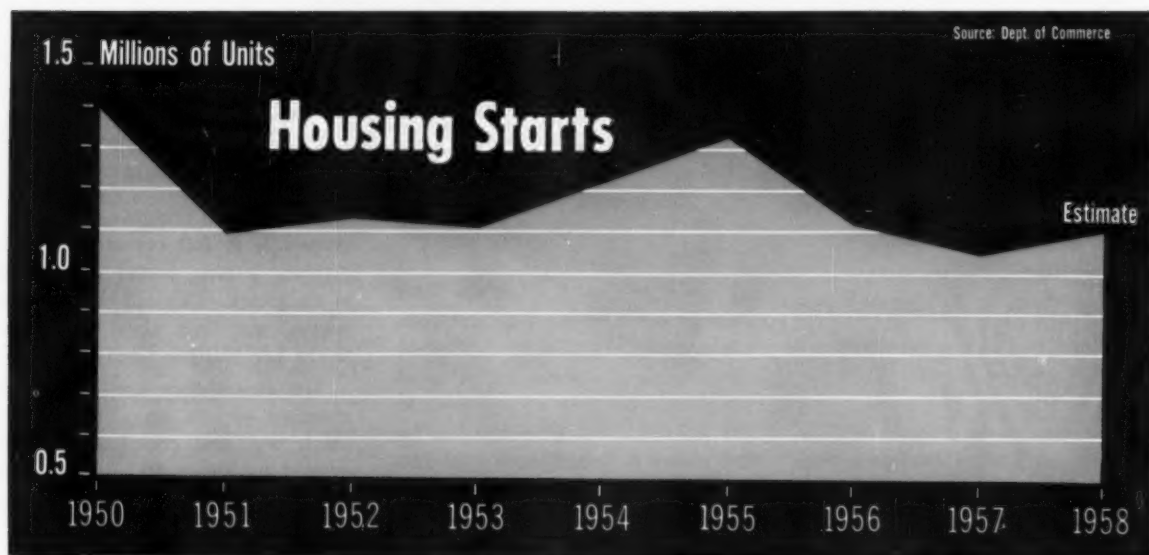
New engineering specialties such as astronautics.

Emphasis on manufacture of high quality components with minimum tooling.

Efforts toward cutting to five years from present eight to 10 years, lead time required to advance from development contracts to prototype hardware.



# Housing Makes a Timely Comeback



## Housing Gains Help Metal Sales

**Construction of an expected 1.1 million homes this year is good news for metalworking.**

**There's growing trend to pre-fabricated units using substantial tonnages of steel and aluminum.—By K. W. Bennett.**

■ Housing starts continue their upswing. For home builders 1958 will be a year of gains, not declines.

The builders expect to put up 1,100,000 units this year, but the final total may be 70,000 units higher. Even a 1,100,000 home year is good news for metalworking. It means 2.2 million tons of finished steel will be used for construction alone. Adding furniture and appliances jumps the steel use in new homes to 5,060,000 tons.

The National Home Builders Assn. estimates the average house requires 1.9 tons of steel in its construction. When the steel used in washers, dryers, ranges, refrigerators, and other appliances is included that figure is doubled.

**More Pre-Fab Units**—Two developments in housing are important this year. One is the construction of low cost homes. The other is the trend to prefabricated homes.

Pre-fab construction will account for 100,000 to 105,000 homes this year, according to the Home Manufacturers Assn. That's above the previous record of 94,700 units in 1956. And it's way above 1957 totals.

**Containing More Steel**—Since metalworking has a large stake in pre-fab homes, these gains are important to metal marketers. U. S. Steel Homes will switch this year to complete steel frame construction—rather than the combination wood-and-steel frame of the past two years.

National Homes has announced a Viking line of homes, featuring aluminum sidewalls and roofs. Prices began at \$8750. The U. S. Steel home uses about 1.5 tons of cold-rolled steel in its frame, will probably switch to hot-rolled sheet

for economy. National's Viking requires 3000 lbs of brake-finished aluminum sheet which is supplied by Alcoa, Kaiser, and Reynolds.

**Low Cost Housing**—Pre-fab home builders are in the forefront of the drive to supply houses priced to sell. National has a Fairlane model, priced at \$7600, which is aimed at buyers in the \$70 a week salary bracket. The Fairlane is said to represent about 65 pct of the company's sales volume. National hopes to beat 1955 records by selling 24,000 homes this year.

**Mission Accomplished**—Exhaustion of Federal funds to encourage low cost housing construction hasn't hurt the building spurt. An extra \$1 billion which Congress gave the Federal National Mortgage Association in May is gone. But the FNMA funds were mainly designed to give housing a push and spur construction. The money was appropriated for building which will be done over the next year.

# Aluminium Builds Power Backlog

## Firm's Hydroelectric Project Is Capacity Insurance

New plant now under construction will increase Aluminium's power output to 3.58 million hp by 1960.

Current production doesn't require it, but Aluminium is looking ahead—By F. J. Starin.

■ Sometime in the summer of 1959, Aluminium Ltd., Canadian alumi-

num producer, will pull a 100-ft diam, 50-ft thick, solid rock plug, at the bottom of a reservoir, 130 ft below the surface.

Water will surge from the Peribonka River, via the reservoir, through an eight-mile, horseshoe shaped tunnel carved out of solid rock, and back to its source. On the journey it will drop 630 ft from the source to five, Francis-type ver-

tical shaft waterwheels.

**Million HP Output**—When the project is in full operation it will produce a nice, round million hp of electricity. This will be sent over transmission lines about 100 miles to the Isle Maligne terminal station.

The powerhouse itself is a vast chamber 465 ft long, 70 ft wide, 70 ft high and completely underground by about 500 ft. About 3 million cubic yards of rock had to be drilled, blasted, and excavated for the tunnel and powerhouse.

**Costs \$140 Million**—The project is at Chute-des-Passes, in the bush country of Quebec, about 500 miles northeast of Montreal. It was begun in September 1956, and despite the plug pulling scheduled for next year, it won't be fully completed until about March 1960. By that time it will have cost Aluminium Ltd. about \$140 million.

When completed it will up Aluminium Ltd.'s hydroelectric capacity in the Quebec area to about 3.58 million hp. Production of aluminum requires more power than most other major metals. It takes about 20,000 kw hours to produce one ton of aluminum.

One major problem the Chute-des-Passes power plant will solve is the recurring one of water shortage. Since the company is entirely dependent on hydroelectric power, its ability to produce can be knocked out by a water shortage. Several years ago, when aluminum was in short supply, a brown out caused by a drought cost the company about 90,000 tons of primary aluminum production.

**Not Needed Now**—When the Chute-des-Passes project is finished Aluminium's rated power capacity in Quebec will about equal all the power plants supplying the follow-



**BIG HOLE:** Men and machines appear lost in immensity of tunnel carved out of solid rock by Aluminium Ltd. as part of huge hydroelectric project in Canada. Eight-mile tunnel is horseshoe-shaped.

ing 11 cities: Cincinnati, Seattle, San Francisco, Dallas, St. Louis, New Orleans, Boston, Oklahoma City, Hartford, Washington, D. C., and Kansas City.

As vital as hydroelectric power is to Canadian aluminum (they use no other source of power), and as impressive and expensive as the Chute-des-Passes project is, the additional power is not particularly needed right now.

Aluminium Ltd. is currently operating well within its smelter capacity, at about 72 pct. And even at full capacity, Aluminium in the past has generated enough electricity to supply over 30,000 domestic, commercial, and industrial customers in the Quebec area, without noticeably slighting its own needs.

**Ready to Tap**—Aluminium Ltd. is, in effect, looking to the future with Chute-des-Passes. With the power already there, new smelter capacity can be put in, almost from the ground up, in about a year, before a favorable market can evaporate.

Several years ago, Aluminium's expansion plans would eventually have made it the largest producer of aluminum in the Free World, passing the current leader and its former parent, Aluminum Co. of America. Softening markets forced some changes in plans. But with projects like Chute-des-Passes, Aluminium Ltd. may not have completely given up the idea.

### Jet Uses Magnesium

More than 500 lb of magnesium are used to boost the power-weight ratio of Canada's new CF-105 "Arrow" jet fighter plane, according to Arvo Aircraft Ltd., the manufacturer.

Magnesium alloy sheet is used for a substantial percentage of the fuselage skin. Machined magnesium-thorium plate is used on the underside of each wing. Extensive use is made of mag castings in the craft's twin engines.



**BOLD SYMBOL OF CHANGE:** Worthington Corp. officials discuss new trademark—massive "W"—which is replacing old winged emblem. They are, (l. to r.): T. J. Kehane, vice president-marketing; H. C. Ramsey, board chairman and chief executive officer; and W. H. Feldmann, president.

## How Change Paid Off For Worthington

■ When Worthington Corp. switched its trademark this week (see above) to a new dramatic "W" it symbolized the success of the company's ten-year reorganization drive.

The revitalization moves—which brought record income last year—began back in 1949 when newly-elected President and Chief Executive Hobart C. Ramsey launched a three-part program. He aimed for expansion, diversification, and improvement of organization and performance.

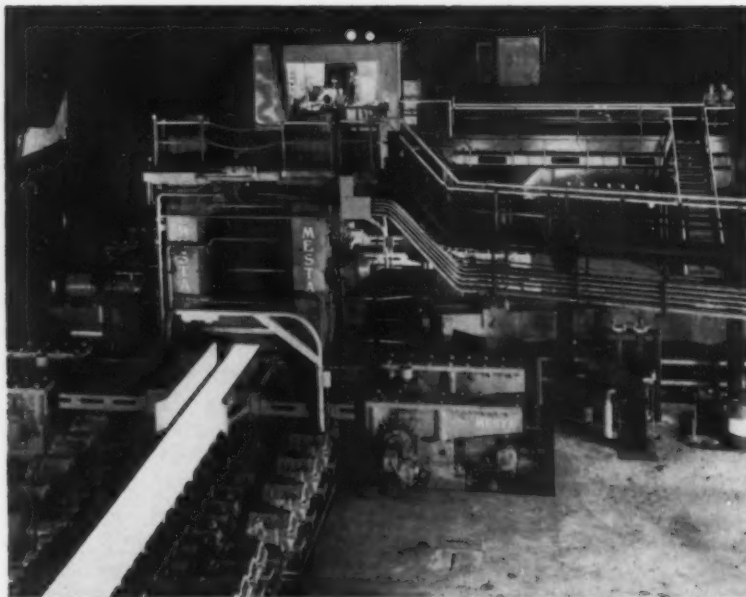
Under a new divisional setup Worthington is able to combine: (1) a specialized company's speed and knowledge of customers and products with, (2) a large company's advantages in finance and diversification.

**Geared to Buyer** — Another development in Worthington's

change of pace was its "gear-to-the-customer" marketing program. For this the sales force is divided into two groups: direct sales and re-sale. In direct sales Worthington technical representatives individually handle customer accounts. In the re-sale area distribution representatives serve a variety of distribution relationships. With these dual sales contacts, sensitive to buyer needs, Worthington can provide customer coverage in depth.

**Where It Helps**—Worthington's divisional organization has these advantages, according to company president Walter H. Feldmann: It provides the agility, speed of decision, and teamwork needed to match smaller specialized companies. It places authority to make decisions near where action is needed. It allows the company to get greater knowledge into play.

## Key Operation in J&L Expansion Program



**GOING TO WORK:** A steel slab is ready for a pass through new reversing roughing mill on the 77-in. hot strip mill at Jones & Laughlin's Cleveland plant. It's the key phase of a \$90 million, two-year expansion program.

### Better Missile Sought

Army missile men are still shopping around for a completely satisfactory antitank missile.

The Army has just cancelled a contract for development of the Dart missile. Development work on the solid-propellant Dart cost the Army \$40 million. Several other missile designs including the French SS-10, a wire-controlled antitank weapon, are being considered a replacement for the Dart.

### Midvale Expands

Midvale-Heppenstall Co. is investing \$5 million in new melting facilities. Contracts have been placed covering the purchase and installation of a new 100 ton arc-type electric furnace to replace acid openhearth now being used.

Two smaller electric furnaces—a 50 and 15-ton size—will be moved into the new melting department so that all castings of large ingots will be in one location. A vacuum stream degassing system will be installed for quality improvement.

A third phase of the program provides a new scrap yard which will be under roof and immediately adjacent to the melting floor.

### Ore Concentrates To Expand

Demands by the steel industry for higher grade ores will bring more expansion in ore concentrating plants in the U. S. and Canada.

The prediction was made by H. C. Jackson of Pickands Mather & Co. before the American Mining Congress convention in San Francisco. He is a vice president of the Congress.

**Tax Aid Needed**—Mr. Jackson pointed out that the U. S. cannot presently produce enough iron ore to keep the steel industry operating at full capacity for any substantial period. Foreign iron ore imports, which this year are expected to total 30 pct of U. S. requirements, are a necessary supplement to domestic production, he said.

Referring specifically to the Lake Superior District, he said that plants

for concentrating intermediate grade ores may be built and expanded "provided proper tax treatment by local and state government can be assured on a long-term basis."

### Subs to Revive Shipyards

Shipyards may soon be humming with activity again, says submarine expert Admiral Momsen (USN retired). This country is now in a position to go ahead with production of nuclear subs, he indicated, except for details of missile launching design which remain to be proved out.

Even more important to industry, he said, is the development of underwater transport. We can in the future transport raw materials underwater at higher speeds than possible with surface vessels, he added.

**60 Knots and Faster** — The Admiral, now associated with General Dynamic, pointed out that all nuclear subs are being built in industrial rather than government shipyards. He foresees nuclear-powered cargo ships, tankers, and passenger vessels for underwater use that would travel at 60 knots and above.

### Ensley Starts Up

U. S. Steel's Tennessee Coal & Iron Div. will resume limited steel-making operations Sept. 28 at its Ensley Steel Works in Birmingham, Ala. The Ensley plant has been shut down for repairs since July 6. A. T. Wiebel, TCI president, said two of six blast furnaces will be refired.

The two furnaces will be reopened to offset production losses when the No. 5 blast furnace at Fairfield Steel Works is shut down for relining early in October.

A major repair program at Ensley has not been completed and will continue for some time, Wiebel said. Resumed operations will be gradual and employees called back as needed. The rail mill will remain idle due to lack of orders, Wiebel said.

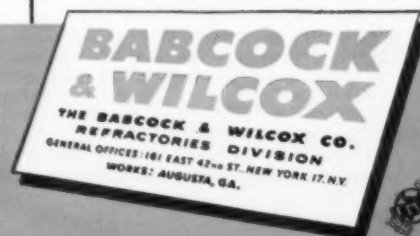


# PROOF: B&W Refractories withstand CO and H<sub>2</sub> prepared atmospheres

ATMOSPHERE	APPLICATION	CONSTRUCTION	RESULTS
60% CO	Pusher Type Malleabilizing Furnace	Walls lined with B&W K-23 Insulating Firebrick backed with B&W K-20 IFB. Roof construction—9'-0" wide sprung arch of B&W K-23 IFB.	No major rebuilding in 21 years.
40% CO	Radiant Tube Annealing Furnaces	Bases lined with 7" Kaocrete-A, backed with 6" Kaolite-20. Base size—21'-9 $\frac{3}{4}$ " x 9'-9 $\frac{1}{4}$ ". Temperature 1550 to 1600 F.	In service 11 years. Reducing atmosphere has no effect on the base. All portable annealing furnace bases in plant lined with B&W castables. <i>Maintenance costs reduced greatly.</i>
	Malleable Iron Company	Bell type covers lined with 9" B&W K-23 IFB standard shapes in the arch, side and end walls. 13 $\frac{1}{2}$ " K-23, with Kaowool, is used around the radiant tube openings. Cover is 22'-6" x 10'-5 $\frac{1}{2}$ " outside x 8'-4 $\frac{1}{2}$ " to top of arch.	After approximately 6 years of service, lining showed no disintegration from reducing atmosphere.
65% CO	Radiant Tube Annealing Furnace	Base lined with 5 $\frac{1}{2}$ " Kaocrete-A and 3 $\frac{1}{2}$ " Kaolite-20 on top of 5 $\frac{1}{2}$ " of block insulation. Base size 21'-9" x 9'-9". Temperature 1700 F.	Formerly heavy firebrick linings required rebuilding yearly. B&W castable construction has given more than 9 years' service. Customer standardized on B&W castables.
100% N <sub>2</sub> and 100% H <sub>2</sub>	Elevator Type Annealing Furnaces  Large Steel Co.	Walls lined with 9" B&W K-23 IFB plus 3" K-20 IFB. Furnace size 6'-0" x 16'-0" x 4'-0". Temperatures in excess of 2100 F.	B&W refractories show no sign of deterioration in six furnaces of this type in 3 years' operation. Barring mechanical damage, refractories should give long additional service.
100% H <sub>2</sub>	Rectangular Hood Type Annealing Furnaces	60 Furnaces, 24 have wall construction consisting of 18" B&W K-26 IFB plus 2 $\frac{1}{2}$ " K-1620 IFB. 36 units use wall of 9" B&W K-26 IFB plus 5" K-1620 IFB. Furnace size—12'-0" x 8'-6". Temperature 2150 F.	Of the 60 covers in service only 2 were rebuilt after 2 years' service. Plant masonry superintendent reports no shrinkage; estimates 15 years' additional life if not for mechanical abuse.

Consult your B&W Refractories Representative for helpful information on your prepared atmosphere problem.

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Wilbur Jurden

## Self-Made Man Still in Vogue

**Achievements of men like Mr. Jurden place the value of a college degree in proper perspective.**

**In the final analysis, it's native talent and initiative that count.**

■ Wilbur Jurden is a successful design and construction engineer because that is what Wilbur Jurden chose to be successful at.

Without benefit of a sheepskin, he is top man in Anaconda-Jurden Associates, Inc., a subsidiary of Anaconda Co., formerly the construction engineering department of the parent company.

**Self-Educated**—As a boy fresh from the Iowa cornfields he took a job as rodman on a Union Pacific Railroad project at a place called Horse Thief Canyon. He became interested in the work and began borrowing books.

By the time he was 25 he had learned enough to top the list of 27 who took a California civil service test for designing engineer. He also took the test for construction engineer and was rated third of 91 applicants.

**His Assets**—To his credit with Anaconda are the copper refinery and allied facilities at Potrerillos, Chile, copper reduction works of Phelps Dodge at Morenci, Ariz., American Brass Co. mill at Los Angeles, and the Erie Mining Co.'s taconite plant at Hoyt Lakes, Minn.

Mr. Jurden's main asset is his ability to organize, and his willingness to delegate authority almost completely. He also has a faculty for applying himself to learn all



**WILBUR JURDEN:** His ability to organize paid off.

possible about something in which he takes an interest.

He was once president of the now-affluent Downtown AC in New York. "One of my first official acts was to watch our club sold at auction on a foreclosure. We were given 30 days to move out." Mr. Jurden gathered some top management talent and sent the almost-defunct group winging to new heights.

**Handling Personnel** — At Anaconda-Jurden he is surrounded by about 250 experienced men he has hand picked and brought along. He hasn't hired any new talent in three years because he hasn't had to. His

personnel turnover is very small.

A key factor is that his staff is given the chance to make decisions right from the start. And promotion is strictly from the ranks so that men can move ahead to bigger decisions. The only thing Mr. Jurden professes any worry about is the possibility of men not referring a problem to "the boss" when the situation dictates.

Mr. Jurden has obviously been the driving force in developing his company. But he is proud of the fact that if he stepped out tomorrow, there would be no gap in the firm's management. A good organizer plans that way.



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# Defense Spending Helps Upturn

**Flow of dollars from increased budget is now at a uniform rate. Peaks and valleys of last year are largely eliminated.**

**Sub-contractors also take heart from new policies aimed at maintaining a sound sub-contracting structure.**

▪ Don't underestimate the role of defense spending in contributing to the business recovery.

It may be one of the most significant factors in the picture. Not so much as stimulating the better-than-hoped-for rate of recovery, but in providing a steady flow of defense business to help keep it going.

**Compared With Last Year**—The improved defense spending picture looks much better when contrasted to a year ago. With hindsight, it's now easy to see how uncertainty then contributed to the recession.

A year ago the Defense Dept. was in the throes of cutting back its spending to within budget limits, after underestimating spending and exceeding the annual budgeted rate. This, of course, was before Sputnik, when wraps again went off.

**Big Contrast**—Some of the contrasting figures are almost unbelievable. Obligations for Army procurement and production in July, 1957, were at a standstill \$14.6 million. In July of this year (the first month of fiscal '59) the figure reached \$360.7 million.

For the same July to July 1958 comparison, Navy aircraft and related obligations rose from \$65.6 million to \$86.6 million. Air Force aircraft and missile procurement obligations were \$85.8 million in July, 1957, in contrast to \$316 million this year.

**Effects Underestimated**—The full extent of the economy measures of a year ago probably was not appreciated at the time. But the July, 1958, rate does not indicate just a temporary surge. August figures should be very close to July.

Pentagon financial experts are now firm that the hand-to-mouth placing of orders is over. Whether you approve or not, a major factor here is the raising of the debt ceiling, which permits more realistic scheduling of expenditures.

**Uniform Spending** — Programs are now laid out for the entire year.

At the start of the fiscal year, the Dept. of Defense notified the military services to continue on a normal basis and place their contracts at a rate of close to one-twelfth their annual expected rate.

Obviously, not all projects can proceed at a uniform level and allowances are made for flexibility. It's realized that all forces can't be controlled entirely.

But you can expect defense spending to click along at about \$750 million a week, with \$300 million a week going for procurement through the rest of the year.

## Sub-Contractors Get Help

**Sound Structure** — Another significant point in Defense spending is the improved picture from the standpoint of the sub-contractor.

The philosophy now, particularly in the Air Force where the missile program places such importance on sub-contracting, is to protect the efficient sub-contractor and to maintain a sound sub-contracting structure.

**No More Absorbing**—Here, again, is a contrast to the situation when aircraft cutbacks hit. Then, the prime contractor absorbed as much of his sub-contracts as he could, filling his own operations at the expense of his suppliers.

The feeling now is that a system of sub-contracting firms must be assured to protect against contingencies.

**Must Cut Costs**—In that light, the prime contractor now must prove he can make a part at less cost before he can take any sub-contract away from his source. And

they are finding this is difficult to do since the supplier in many cases is a specialist in his field.

In the general business picture, the sub-contractors are now picking up and new orders for defense business are accelerating. The new, larger budget, plus the assurances of a firm rate of defense business, is now beginning to take full effect.

## How Fast a Pickup?

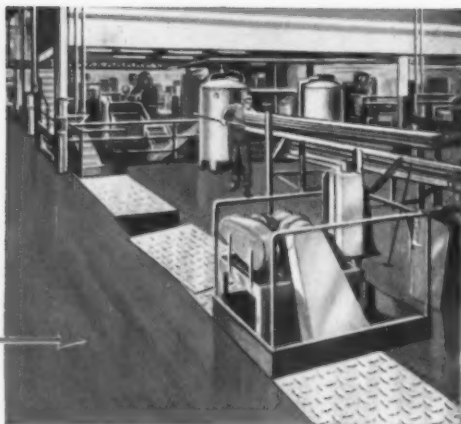
The few optimists who dared show their faces last April now appear to be vindicated.

The Federal Reserve Board's Index of Industrial Production rose to 137 in August, wiping out more than half of the decline from the peak of 145 a year ago to 126 in April.

Because of auto changeovers, the September rate probably will not indicate a rise in keeping with actual business conditions. But there's no reason why the Index can't hit 140 this year.

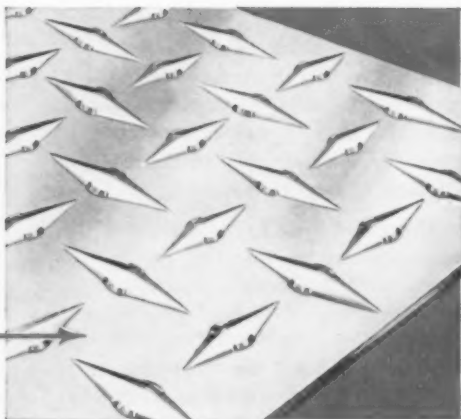
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# How to Develop Executive Ability

By William B. Given, Jr.—Chairman, American Brake Shoe Co.

**Developing your executive abilities requires, first, self-analysis; second, a program**

**Here are some recommendations both specific and general, to add to your value to your company.**

▪ Every man hoping for advancement in business owes it to his family, himself and his company to do everything possible to make himself ready for promotion and worthy of it.

In order to meet this responsibility, he must first wage a constant fight against complacency. Complacency inhibits desire for self-improvement and saps a man's ability to grow beyond the limits of his present job.

Factors like technical knowledge and experience being equal, the man who constantly strives to

broaden himself is going to have the inside track for promotion.

**Human Qualities Count**—Often, two or more men are equally well qualified technically for advancement. Selection of the right man depends on other considerations; on the whole range of human qualities that make a successful executive.

The first step for advancement is to know what these qualities are. Lists of these qualities vary widely, in length and wording, but there are some basic qualities that appear on all of them.

These are: Leadership, courage, judgment of people, imagination, depth of interest, getting the job done, specialized knowledge, general knowledge, and integrity. (These are spelled out in detail on following pages.)

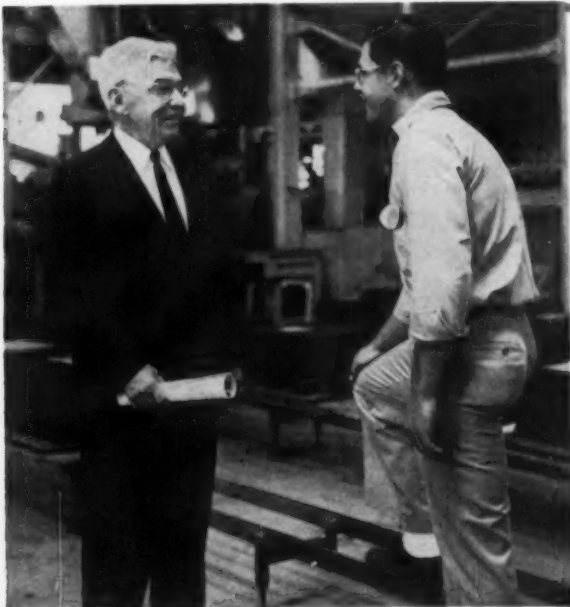
**Principal Steps**—After establishing these qualities, or values of ex-

ecutive leadership, there are two principal steps toward advancement: 1. Self appraisal; 2. Development of the individual's program. These are not simple steps by any means.

A good place to start on self analysis is with some quiet thought about accomplishments and failure. This should result in an impressive list of things that need improvement. There will be some glaring omissions, for most of us like to admit only our least serious shortcomings. But the list will be a beginning, and should be revised later. Then, the time has come to get help from others.

**Ask the Boss**—The most helpful person of all should be the boss. The development of people is one of his major responsibilities, and a sincere desire in a man for self-improvement makes his job easier.

If a man and his boss are com-



**"Telling a man how to develop himself is a little like telling him how to climb a tree. He can appreciate the wisdom of what you are saying, but it doesn't really get through to him until he does it himself. In American industry today there are more important jobs than ever before for men who can do it themselves."**

**William B. Given, Jr.**

patible, a face-to-face discussion of strengths and weaknesses is the most valuable course possible.

To supplement the boss' judgment, or as a substitute if an objective discussion is not possible, a man should seek the counsel of his co-workers, and his family.

**Seek Out Qualities**—Another way for a man to learn about his weaknesses, so that he may do something about them, is to explore his experience, to think about the leaders with whom he has had contact and determine what qualities made them good or bad.

What qualities did his favorite teacher have? Why did a certain professor fail to get across to many students? What made his superiors in the armed forces poor or effective leaders? Each of us has had experience with many leaders and, if we are wise, we will learn from each of them.

Finally, a man can learn a great deal by trying to find out why some people don't like him. Few people are universally popular; most of us have a few more or less cordial enemies. If we don't know why these people dislike us, we may be overlooking our most glaring faults.

**Time to Act**—Having done this agonizing self-appraisal, the time has come to do something about it, to translate what he has learned to a program of improvement, and, advancement.

Fortunately, everyone with determination can improve his rating in the nine qualities I have listed (see above) and probably also in areas his self-appraisal shows need attention.

Here, there is no set formula, no magic method that will make a man over within days or weeks. But the first, and perhaps hardest, part of the job is done. He has become aware of the need for constant growth; and he has learned in what areas his effort should be concentrated. But none of this will help unless he does something about it.

The problems themselves will suggest what ought to be done. If a man determines that his vision is

limited by lack of knowledge in fields outside his immediate job, the solutions should be obvious.

He can determine to read more, in a variety of fields. He can sign up for night or extension courses; he can spend more time with other company people discussing their work.

He can offer help in areas where his skills would help, even if not directly related to his specialty.

**Points of Advice**—If a young man were to ask me for some specific ideas to use for his development, I would offer these:

Remember that your own advancement will depend mainly on the contribution you make to the company's success. Hard work alone is not enough if the results do no measure up. Gear your program toward the accomplishment of specific goals related to your company's progress, not to self-aggrandizement.

Where you are sure of your ground, and where the goal is important, fight for what you believe. Everyone respects a man with courage of his convictions. Even if you are finally overruled, you will have gained in stature if your arguments are sound and well presented.

**Broaden Your Knowledge**—Extend yourself both by helping others in their work, and by seeking their help with your problems.

The broader your knowledge of the company, the more fields in which you will be able to contribute. Study departments other than your own. Take an interest in production, sales, finance, public relations, safety, cost reduction, engineering, and even legal matters. Ask questions; displaying a little "intelligent ignorance" is necessary if you are to learn anything.

The more you know about your industry, American business, and national and world affairs, the broader the range of knowledge you will be able to bring to bear on any problem. Read the trade papers and magazines that deal with your in-

## Human



William B. Given, Jr., had already made a good start at American Brake Shoe when he returned to the company from World War I service as an officer in the "Fighting 69th."

He was named a vice president in 1921 and became president in 1929. He moved to his present position as chairman of the board in 1950, continuing as chief executive officer until 1957.

Under his administration, the company grew from a few plants manufacturing railroad products to a diversified company with a range of products used by almost every major industry.

Underlying his management philosophy is his zeal for getting everyone in the company to carry a full

dustry, good daily and financial newspapers.

**Learn from Mistakes**—There is much to be learned from the men who have risen to the top in your company and others, and in non-business fields. Read an occasional biography of a man of achievement.

Learn from mistakes—your own and your boss'. There is more to be learned from mistakes than from a whole series of right guesses. But mistakes are valuable only if they teach a lesson—making the same mistake, or even the same kind of mistake, twice, is bad.

Investigate the training courses your company offers, and those offered by trade associations and industry groups.

Weigh the possibilities of taking outside courses in subjects you feel would add to your capabilities, even if they are not related to the work you do now.



# Qualities Help Make the Executive

share of responsibility for management.

**In outlining a program of self-development for the young executive, Mr. Given lists as key points a number of "human qualities" that make the successful executive. He believes advancement in these human qualities is essential to advancement in the company. They include:**

**Leadership**—It means rating people's confidence. True leadership is earned by performance, and a man who has developed it rarely has to pressure anyone to accept his counsel.

**Courage**—It feeds on itself and grows as it is used. Business is an endless succession of informed guesses and calculated risks, with risk of failure always present. With-

out courage . . . failure will become not a risk, but a certainty.

**Judgment of People**—It grows as a man's real interest in people grows. The executive who considers every move in terms of the people it will affect has a greater chance of long-range success than the man who thinks only of statistics.

**Imagination**—A different point of view sometimes helps. Try looking at it from the other fellow's angle.

**Depth of Interest**—This feeds on happiness in your work. Everyone has had bad days, when nothing seems worth the effort. These days should be met as challenges.

**Getting the Job Done**—This is bound up with organization, planning, and effort. I don't know anyone who wouldn't accomplish more

if he were able to plan his time more effectively.

**Specialized Knowledge**—It grows with job experience, study and making mistakes. It is an important factor, but not the only one. It is in this area that many people tend to concentrate, at the expense of development in other directions.

**General Knowledge**—It grows with an interest in things not directly related to the job. There is practically no area of human knowledge that cannot be applied in some fashion to better performance in business.

**Integrity**—Without this, no one qualifies for leadership. The man who does not demonstrate high integrity in his present job certainly does not deserve a better one.

**Plan Ahead**—Find a way to get along with difficult people. The mark of a leader is that he can guide many people of varying temperaments and convictions toward a common objective. Tact, diplomacy, and persuasiveness are essentials for business success.

Plan your work as far in advance as you can. If possible, set goals for the next two, three, five, or ten years. Evaluate your short-range work in the light of these long-range objectives. Plan your work day by day. Keep a simple list of things that have to be done, in order of importance. Try to work on the top of the list, then work undone will be the less important.

**What About Luck?**—Take a critical look at your yesterday. Ask yourself what more you could have done, or how you could have done it better.

Realize that luck plays a part, as well as ability and effort. But also realize that to a large extent you

can make your own luck. Perhaps you can't plan to be in the right place at the right time, but you can plan to be the right person, in which case the right place may come looking for you.

**Delegate Authority**—If you are in a position of supervision, surround yourself with the best people you can get, and give them every opportunity to grow. Pass on as much responsibility and authority as possible, so you can build a capable, smooth-running organization. Develop people who can take over your job. If you do this properly, you free yourself for a move up, and your department will not suffer from your promotion.

If you cannot delegate authority to the people under you, you are doing their jobs, not yours.

Have courage. This is easier said than done, but it is absolutely essential for a man in a position of any importance. The successful executive does a lot of guessing, and

if he is good, his right guesses will outnumber his wrong ones. But there will be wrong ones; they are to be expected and welcomed for the lessons they can teach. There is nothing truer in business than the old bromide "Nothing ventured, nothing gained."

Be ready to take on something new or something extra—even if you have little or no experience in the field. Chances are that a man who does well in one job will do well in another. Your bosses would not offer you an opportunity outside of your regular field unless they thought you would do well at it. At the least, such a challenge will be educational—and it may be the test that shows your superiors you are ready to step up.

**Reprints** of this article are available as long as the supply lasts. You may obtain a copy from Reader Service Dept., The IRON AGE, Chestnut & 56th Sts., Philadelphia 39, Pa.

# Price Tag Law Goes Into Effect

**New stickers, showing manufacturers suggested price, aim at giving buyers a fair shake.**

**Federal law requires all new cars to carry stickers from now on.—By H. R. Neal.**

■ The new manufacturer's price sticker will make its first appearance this week on the 1959 Buick, first of the new models to go on sale. The sticker—to be placed in a prominent place on each car—is required by the Automobile Information Disclosure Act.

The law is designed to give prospective customers an idea of the fair price for a vehicle as suggested by the manufacturer. However, it's not designed to "set" a price for the car. This is forbidden by law. Only the dealer can set a final sale price, so bargain hunters can still shop around.

**Lists Pertinent Facts**—The Disclosure Act requires the manufacturer to list the make, model and

serial number of the car, and the final assembly point—location of the domestic plant or port of entry for foreign cars.

In addition, it must contain the name and address of the dealer to whom the unit is delivered. If the delivery point to the dealer is other than his regular place of business, this must be noted. And the method of transportation must also be revealed.

**U. S. Tax Included**—Then it must contain the manufacturer's suggested retail price for the unit and for each factory-installed option and accessory, plus transportation charges to the point of delivery, and the total of such prices and charges. Prices shown include federal excise taxes and suggested dealer preparation charges.

Items not required to be shown include charges for gasoline, anti-freeze, dealer installed accessories, license fees and state and local taxes.

## **Desoto Modifies 'Forward Look'**

DeSoto's "Forward Look" styling has been modified for 1959. Front end sheet metal changes give new models a wider, lower appearance, (see cut below) A new integrated front bumper features a long horizontal air passage between the upper and lower section. Front fenders form "eyebrows" over dual headlamps. And four-door hardtop models have a new sculptured roof line which is said to add 3.5 in. to 1.75 in. to headroom.

**More Power**—DeSoto is offering 18 models in four series—Firesweep, Firedome, Firelite and the limited production Adventurer. The Adventurer series is available only in the two-door hardtop and the convertible. Pushbutton three-speed Torqueflight transmission is standard on Firedome, Fireflight, and Adventurer. Firesweep models are built on a wheelbase of 122 in.,



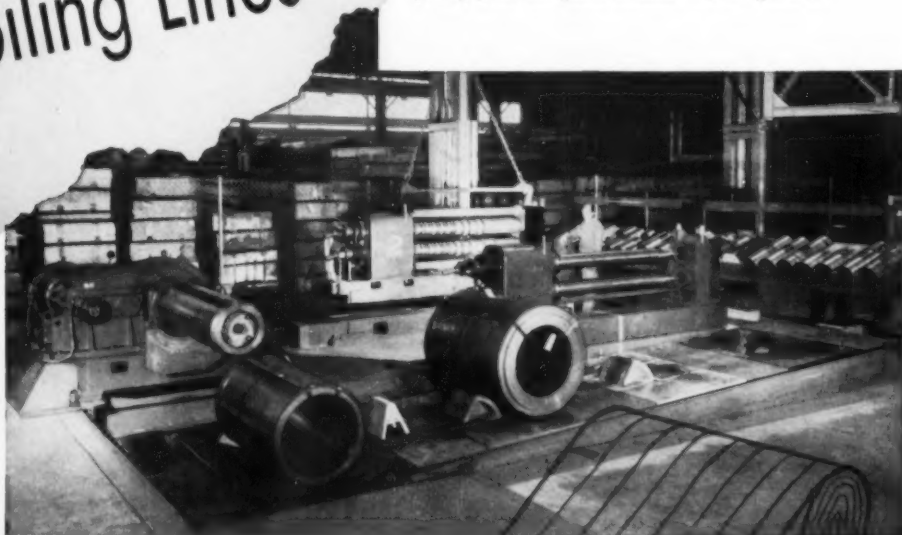
**NEW DESOTO:** Height is unchanged, but there is more headroom in 1959 DeSotos. Engines are more powerful.

# Step Up Production with **Stamco** Coiling Lines

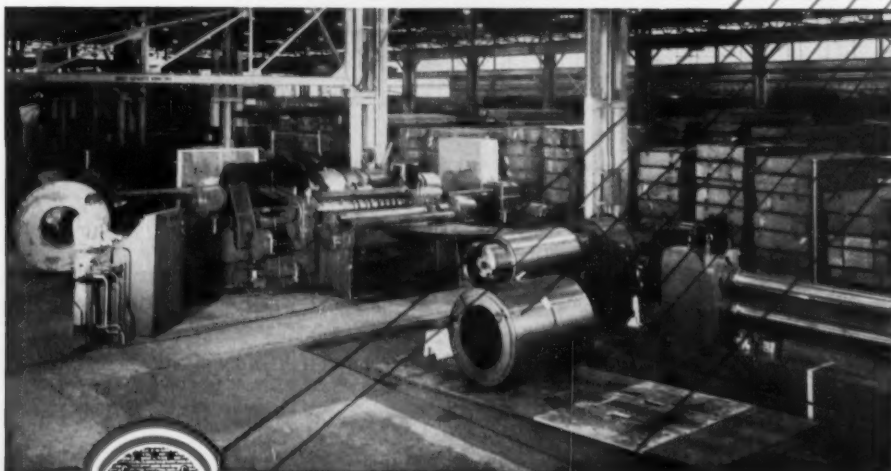
*Stamco Slitting and Coiling Lines will step up your production because they are designed to meet your particular specifications. Years of experience have led to the development of equipment that will meet every slitting and coiling requirement. Stamco slitting and coiling lines are now efficiently handling coils from 500 to 60,000 pounds and are designed to give dependable, maintenance-free service.*

*Write us, stating your requirements . . . we'll gladly give complete details—no obligation.*

View shows coil and traverse, coil pay off reel, coil loading ramp and detachable slitter head.

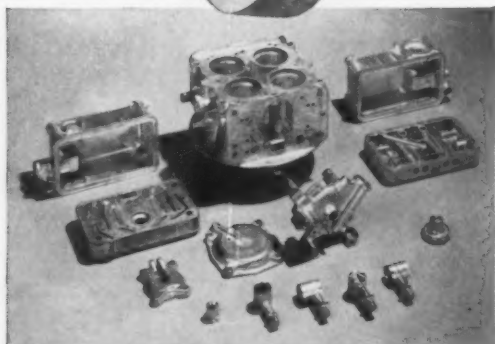
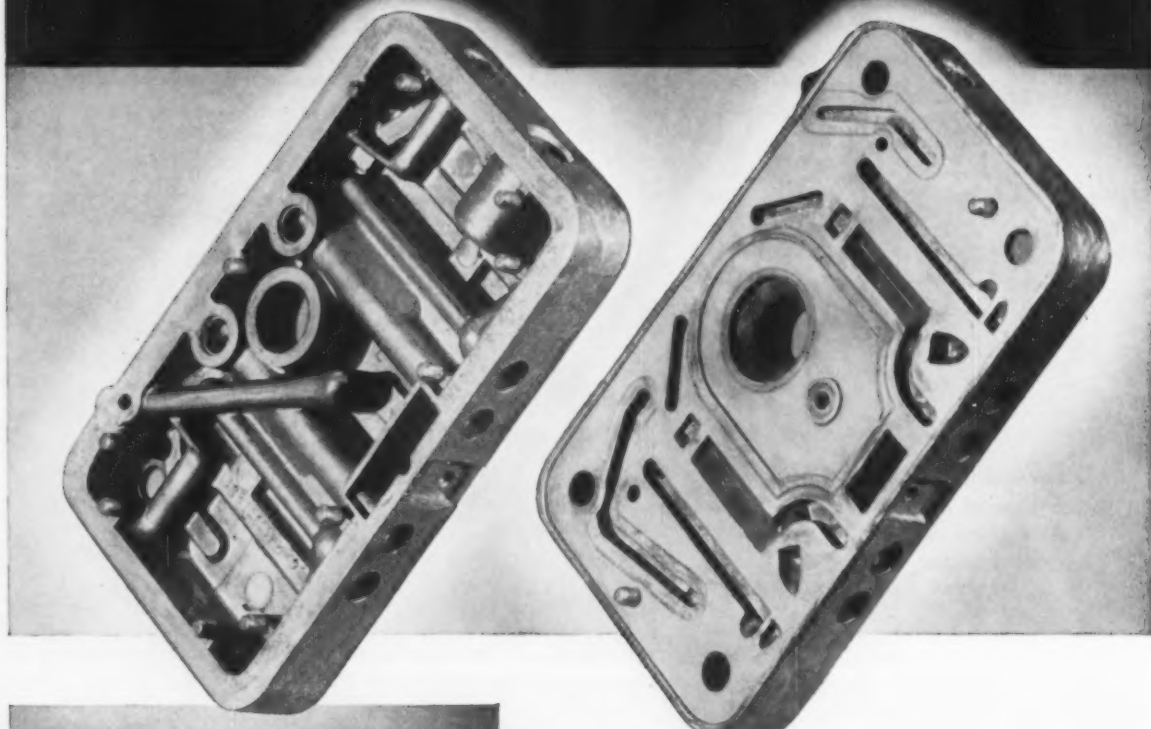


Overall view of coiling line from entrance end.



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## Automotive Production

WEEK ENDING	CARS	TRUCKS
Sept. 20, 1958	39,224	15,273
Sept. 13, 1958	24,072	6,876
Sept. 21, 1957	52,365	13,441
Sept. 14, 1957	85,816	16,777
TO DATE 1958	2,818,748	589,824
TO DATE 1957	4,619,819	805,174

\*Preliminary

Source: Ward's Reports

which is 4 in. shorter than the other three series.

Horsepower has been boosted for all engines and a top performance engine will be available on all models. For the first time, the sports engine of the Adventurer is available on all models in the DeSoto line. It delivers 350 hp at 5000 rpm. Output of the Firesweep is given as 290 hp while engines for the Firedome and Firelite series are rated at 305 hp and 325 hp. Compression ratio for the Firesweep engine is 10.0 to 1 and for the other engines it is 10.1 to 1.

**Swivel Seat Option**—Automatic car leveling under all load conditions will be available, at extra cost, through rear air springs in combination with metal leaf springs. Torsion bars continue to be used for the front suspension.

Push buttons replace the usual levers and controls used to regulate heaters and air conditioners. Swivel seats, in which each seat pivots outward in a 40-degree arc for easier entrance and exit, are also being offered.

## Auto Inventories Dip To 1958 Low

With the majority of automakers about ready to introduce their 1959 model cars to tempt the public, they received some encouraging news.

At the beginning of the month, inventories of new cars reached the lowest levels for the year at 463,000 units. It also marked the first time this year in which new car inventories were below 600,000 units, according to Automotive News, industry trade publication.

The September total is the lowest for any month since last November, when stocks of new cars had been reduced to 449,000 units. Only a month ago the total of unsold cars totaled more than 630,000 units.

But the low inventories at the beginning of the month indicate the strong possibility of a shortage of new cars developing in October when inventories are expected to fall below 400,000 units. It is generally agreed among auto industry marketing executives that just about 400,000 cars are needed for normal sales.

This would further tend to indicate automakers will need to schedule steady production for the remaining months of the year in order to provide dealers with sufficient automobiles for inventory and to handle normal sales.

## Ford Consumer Test

To back up the auto industry's claim it is building passenger cars to meet the needs of the buying public, Ford Motor Co. is asking

400 "representative American automobile buyers" to participate in a Consumer Conference.

Representatives from 400 cities, being selected by opinion-poll expert Dr. George H. Gallup, will convene in Dearborn, Mich., on Oct. 8-9. There they'll meet Ford executives and cover major phases of the auto industry such as the styling, engineering, designing and production of an automobile. Panel members will then be assigned 1959 Ford cars for a month-long testing and reporting program.

## New Import

Gamble-Skogmore, Inc., Minneapolis-based chain of 2200 automotive equipment retail stores has revealed plans to merchandise a small foreign car.

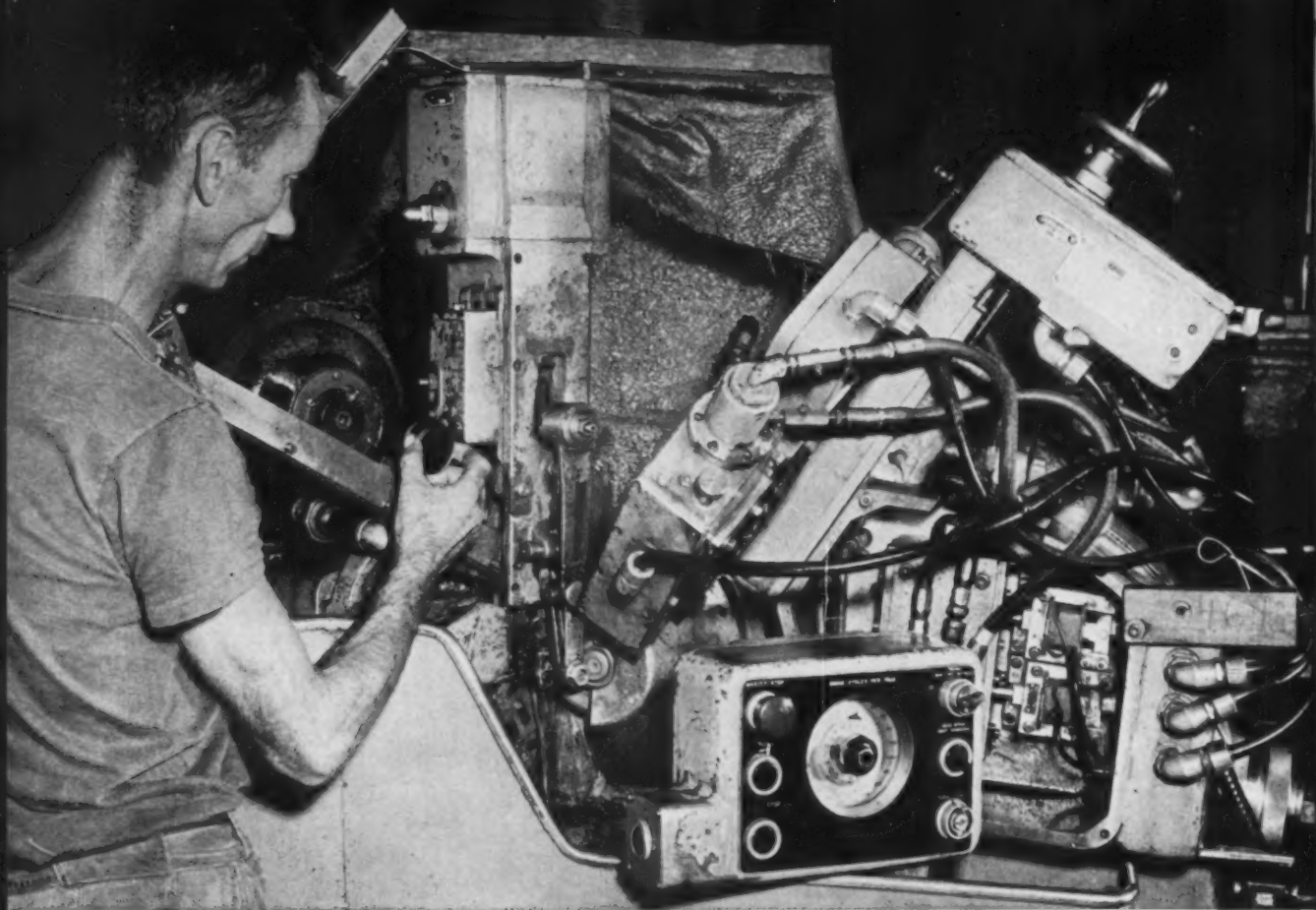
The company has just arranged to handle the Germain Goliath and will turn each of its stores into a dealer. However, the firm's stores won't have to worry about parts, service and trade-ins. They'll all be handled by regular Goliath dealers in each area.

## THE BULL OF THE WOODS



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PUBLIC NUT NO. 1



bearing life boosted from  
**THREE WEEKS TO FOUR YEARS**  
 with Texaco Cleartex Oil

Tyson Bearing Corp., Division of SKF Industries, Massillon, Ohio, extended the life of micro-centric grinder bronze sleeve bearings from 3 weeks to 4 years (and they're still going strong) using *one* oil—Texaco Cleartex B—for both grinding *and* machine lubrication.

Before Cleartex was used, machine bearings would fail in about 3 weeks, because the lubricant became contaminated by grinding oil. With Cleartex this problem simply doesn't exist. A premium quality lubricant, Cleartex is *also* a fine grinding oil. In fact, Tyson now gets as many as 20 pieces per wheel dressing, each with a better finish, compared to the 10 or 12 that were previously obtained.

You can do any machining work better, faster and at lower cost with Texaco—a complete line of cutting, grind-

ing and soluble oils. A Texaco Lubrication Engineer will gladly help you select the right ones for your job. Just call the nearest of the more than 2,000 Texaco Distributing Plants in the 48 States, or write: The Texas Company, 135 East 42nd Street, New York 17, N. Y.



**LUBRICATION IS A MAJOR FACTOR IN COST CONTROL**

(PARTS, INVENTORY, PRODUCTION, DOWNTIME, MAINTENANCE)

# What Democrat Gains Will Mean

## They're Likely to Win More Seats in New Congress

**Both parties figure Democrats will take about 20 Republican House seats in November.**

**This will mean firmer control of legislative program.**

**Here's what's in store for industry.—By G. H. Baker.**

■ Republican congressmen are running scared. Some astounding pluralities piled up by Democrats in some recent elections portend some lost Republican seats in November.

If this happens industrial management can expect some far-reaching legislative reforms next year.

**Legislation**—For one thing, a large Democratic majority means the end of chances for tax reduction. Taxes are more likely to be increased, either by adding to the existing rate schedules, or by addition of so-called user-charges in areas not now subject to tax.

Labor reform will be a dead issue. Bigger federal appropriations will be voted.

Defense spending will rise from the present level of \$40 billion. Federal money-aid to schools, so-called depressed areas, and highway construction will increase.

**Look for Inflation**—The federal budget, already out of balance by about \$12 billion, will continue to show a shortage of income. Labor costs will rise. As a result, inflation will begin to show up again in industrial pricing and consumer prices.

How bad is the situation for Republicans? In the House of Representatives, for example, total membership is now divided among 233 Democrats, 198 Republicans, with

four vacancies. On the basis of recent primaries and elections, experts in both political parties say Democrats will take about 20 seats from Republicans in November.

### The Big "If" In Red Trade Overtures

The Russian government is hinting more broadly than ever, that it wants to order large quantities of machinery in the United States.

The purpose: Large-scale expansion of their consumer goods industries.

The catch: Can they, and will they, pay?

Kremlin leaders have proposed to our State Dept. that they ship us increased tonnages of raw materials (chromium ore, manganese, asbestos, furs, wool, fish) in ex-

change for the consumer goods machinery they need.

**Reds Want More**—But, (here's the catch) the Russians want to "buy" far more than we need, or want, from them. Result: An imbalance in foreign trade.

So the Reds propose we extend them credit for the machinery they want to buy. But the Reds are notorious for failing to pay their bills. (Our state Dept. is still trying to collect for goods shipped under the lend-lease laws of the 1940s.)

**Cash or Nothing**—As a result, the Russian offer to "buy" U. S. machinery is generating no excitement among foreign-trade planners in Washington. Unless, and until, the Reds put cash on the barrelhead, their planned "purchases" probably will never get beyond talking.

## Ike at Odds With Some GOP Candidates

**Ike or Not**—Republicans running for election to Congress are split wide apart on the value of White House endorsement.

President Eisenhower says bluntly he won't campaign for any Republican who did not support him in voting on three key bills: Reciprocal trade, foreign aid, and Pentagon reform.

But many Republicans running for election or re-election don't particularly want a White House endorsement.

**Why Not**—They point out:

(1) Mr. Eisenhower himself is not running for office.

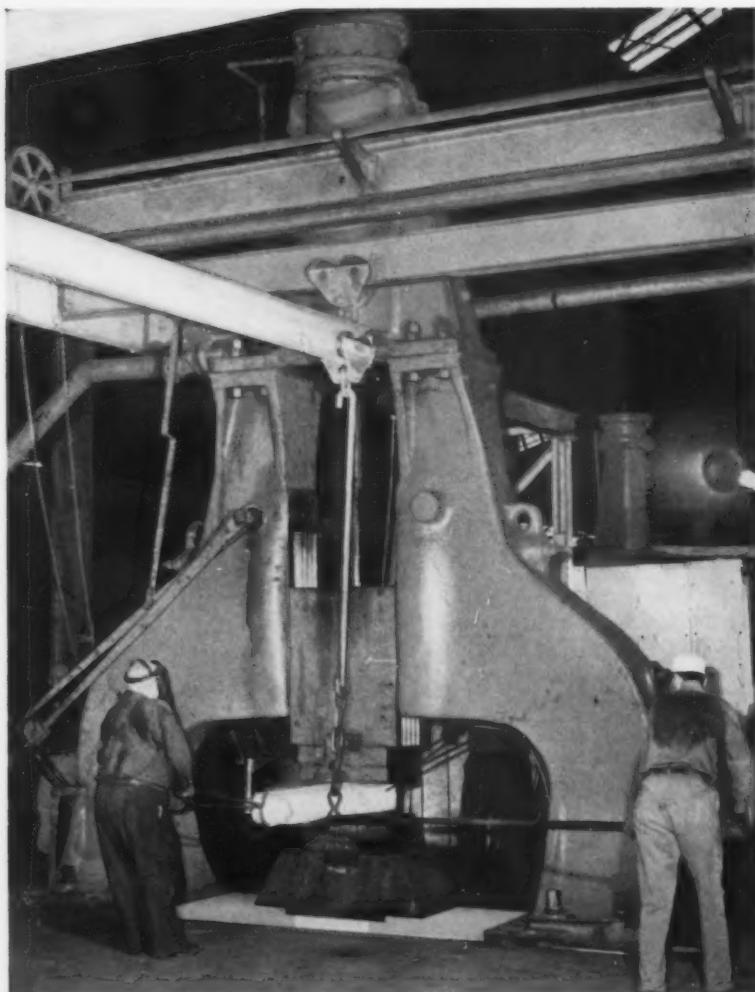
(2) Even if he were, samplings of public opinion show his prestige

has slumped in recent months.

(3) In some geographic areas, endorsement by Mr. Eisenhower is regarded as a liability, not an asset.

**Precedent**—It's not unusual for a President to omit endorsement of selected members of his own political party. This privilege has been exercised by nearly all occupants of the White House. President Roosevelt went so far as to publicly campaign against selected members of his own party (George of Georgia, Smith of South Carolina, Tydings of Maryland, for example) who failed to support all his legislative proposals. The so-called Roosevelt purge failed, incidentally, in each case.





8,000-LB. FORGING HAMMER back in service after braze-welding repairs to its 120,000-lb. anvil, which extends 8 feet below floor level. Color shows location of repair weld.

WHEN the 60-ton, semi-steel base of a big forging hammer at the Jessop Steel Co., Washington, Penn., fractured, management had to make a quick decision. Ordering a new base meant that the hammer would stand idle approximately nine months. Consultation with Maintenance Engineering Corp., of Pittsburgh, specialists in the repair of heavy machinery, showed that the base could be repaired by braze-welding at a big saving in time and money.

Maintenance Engineering got the go-ahead and completed the weld in one week\*—a saving of eight months' production time—at 20% of replacement cost. "We are very pleased with the savings in down time and cash," says Mr. H. K. Taylor, Vice President in Charge of Operations of Jessop Steel Co. "The hammer has been back in service now for over six months and the braze metal is just an integral part of the base."

\*Including preparation, machining and welding—total of 3 weeks.

#### Always consider braze-welding repair.

No matter how bad or how big the break in industrial equipment, it pays to investigate the advantages of repairing it by braze-welding. The savings possible in production time and cost are often surprising. Oxyacetylene braze-welding with Anaconda-997 (Low Fuming) Bronze and Tobin Bronze®-481 Welding Rods is receiving increasing recognition as the easiest and least expensive method of making strong, lasting repairs. For more information and technical assistance on your welding problems, write: The American Brass Company, Waterbury 20, Conn. In Canada: Anaconda American Brass Ltd., New Toronto, Ont.

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### WELDING RODS

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THE AMERICAN BRASS COMPANY

## RECORD BRAZE-WELDING REPAIR ON 60-TON HAMMER BASE PREVENTS 8 MONTHS' LOSS OF PRODUCTION

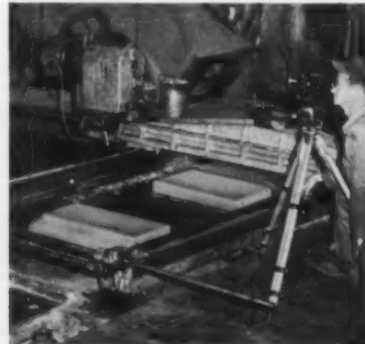


PREPARING FRACTURED SURFACE of anvil to produce a smooth surface with overlap margin. Dotted lines show original outline.



ABOVE: Completed weld which used 2,350 lb. of Tobin Bronze-481 Welding Rod.

BELOW: A portable planer was used for finish-machining the repaired anvil.





# Air Force Watches Missile Cost

## Keep Quality Up and Costs Down, Suppliers Warned

**Exorbitant pricing is never justified, USAF materials chief declares.**

**Dollar value will be used more and more in awarding future development and production contracts.—By R. R. Kay.**

■ If you're working on U. S. Air Force contracts for aircraft, missiles, or components, big profits are on the way out. From here on out Air Force brass will keep a much sharper eye on how much money you make.

That's the word put out by Lt. Gen. Clarence S. Irvine, Deputy Chief of Staff, Materiel, as he dedicated Litton Industries' Salt Lake City plant.

**Cost Watching**—"The Air Force is going to be more and more cost conscious as we move into the space age.

"Neither complexity of equipment nor international tension justifies exorbitant pricing patterns. The industry as a whole can take this as a not very subtle hint. The dollar criterion will be applied more and more as a measuring device in awarding development and production contracts," the USAF materiel boss says.

The economic health of firms serving the industry will depend more and more on the high performance-low cost formula.

**Performance Wanted** — "Functional reliability and structural durability should be virtually 100 pct", Irvine adds. "If components and parts cannot provide performance above minimum specs under the most severe conditions, they

will be considered as not being acceptable," the General says.

### Shipyard Missile Jobs

Some \$37 million is earmarked for new work at the Puget Sound Naval Shipyard, Bremerton, Wash. The work calls for building a \$12 million guided missile frigate and a \$25 million conversion of a missile cruiser.

The yard is making a strong pitch for still more work. It would like to get in on construction of at least some of the 73 ships the Navy hopes to build next year. These

include nuclear subs; also frigates, missile destroyers, and other smaller vessels.

### Jet Engines in Rear?

Mounting engines to the rear of an airplane is the safest way to build jet aircraft. That's how Clarence L. (Kelly) Johnson, vice-president for Advanced Development Projects at Lockheed Aircraft Corp., sees it.

Extensive studies show that rear engine mounting for jet power plants has advantages over pylon-mounted engines on a wing.

### Mating Season Nears for Jet Airliners



**880 TAKES SHAPE:** Fuselage of Convair 880 jet airliner (foreground) is readied for major mating of wing and fuselage sections next month. By June, 1960, Convair expects to be building six 880s a month.

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## STRIP STEEL DIVISION

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CABLE: PETESTEELS

Union, New Jersey

Mr. Specialty Steel Buyer

Everytown, U. S. A.

Dear Sir:

It is with pleasure that we of Peterson Steels announce the formation of the Strip Steel Division, with headquarters at Melrose Park, Illinois.

The new division will promote the sale of razor blade steel, hardened and tempered spring steel, and other cold rolled high carbon steels now being rolled at the Hellefors Works, Sweden, and at the Eberle Works, in Augsburg, Germany.

Cordially,

PETERSON STEELS, INC.

*R. G. Willaman*

R. G. Willaman

President

UNION, NEW JERSEY

DETROIT, MICHIGAN

MELROSE PARK, ILLINOIS

WETHERSFIELD, CONNECTICUT

# Gaging Is Basic Missile Problem

## Millionth-of-an-Inch Still Eludes Fabricators

**How do you hold production pieces to a few millionths-of-an-inch?**

**Survey shows various measuring techniques produce different answers.—By E. J. Egan, Jr.**

■ Missiles and rockets—the vehicles of the Space Age—demand parts machined within millionths of an inch. A multi-million dollar space ship aimed at Mars, let's say, must not end up in the nebula Andromeda. Yet, engineers insist that an error of 12 millionths of an inch in some critical component could cause this to happen.

These sobering thoughts preface a survey one company made to evaluate precision gaging devices and techniques. The firm prefers to remain anonymous, although copies of its survey report were freely distributed by Federal Products Corp. at one of its recent Gaging Seminars.

**On-the-Spot Checks**—The unknown firm's inspection methods team visited major gage makers and Government labs in a search for ways to measure parts more accurately. On each visit, team members carried ring gages and round cylinders of steel and Invar to be checked.

Quoting from the report: "The results of the checks made on the identical ring or round at various establishments showed a lack of uniformity difficult to accept. Each visit and new check generated more bewilderment and, finally, evolved an understanding that absolute measurement to the millionth of an inch cannot be achieved with existing available equipment."

**Nobody's Fault**—The report is in no sense a blast at the nation's gage makers. "They are very much aware of our problem," it says, and continues: "To a great degree it is their problem, too."

Your own experience will give you some idea of what the missile builders and gage builders are up against. When you measure a part to a thousandth or a tenth of a thousandth, you have every reason to feel you're working on a solid, unyielding object. But try to check it to a millionth or so. The same object becomes very unstable, even rubbery.

**A Step Forward**—We have a wealth of ways to measure thou-

sandths and tenths accurately. But will the elusive, absolute millionth of an inch ever be nailed down?

The majority opinion seems to be this: The outlook gives no cause for unbounded joy. On the other hand it is not bleak and hopeless. As the survey report concludes: "Understanding the problem is the first important step toward precise measurement."

### New Film List

A new booklet lists 147 movie films on machine tools and machining. For a copy, write the National Machine Tool Builders Assn., 2071 E. 102nd St., Cleveland 6, O.

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## Checkpoints for Gage Buyers

**Stability**—Is the gage or measuring system capable of drift-free operation over long periods of time?

**Simplicity**—Is the device essentially simple, needing a minimum of mechanical adjustment?

**Sensitivity**—Will the gage repeat consistently to within 10 pct of allowable product tolerance?

**Sturdiness**—Is the device structurally sound enough for the job? Is it sealed against damage from water or dirt?

**Completeness**—Are the essential components designed as a unified package, or are they miscellaneous parts collected from various sources?

**Service**—Are good factory service and a supply of replacement parts readily available?

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## INDUSTRIAL BRIEFS

**Japanese Steel Expansion**—The World Bank has loaned \$22 million to the privately owned Japan Steel & Tube Corp., Ltd. (Nippon Kohan Kabushiki Kaisha) to expand and modernize its production. The loan will cover cost of equipment which the corporation is importing for the construction of a strip mill and expansion of a seamless tube mill, both near Tokyo.

**Carbides in California**—Western Metal Supply Co. of Seventh and K Sts., San Diego, Calif., has been named a distributor for carbide products made by Carmet, the carbide producing facility of Allegheny Ludlum Steel Corp.

**New Name**—C. B. Hunt & Son, Inc., Salem, O., manufacturers of air and hydraulic control valves, has changed its name to Hunt Valve Co. Several new control valves now undergoing final tests are expected to be introduced within the next few months.

**Open for Business**—Scans Associates, Inc., a recently organized Michigan corporation, has opened its new offices and plant at 12940 Farmington Rd., Livonia, Mich. They will engineer and manufacture hydraulic, pneumatic and electrical equipment for the automotive, aircraft and missile industries.



"You know too much!"

**Timken Project**—At an estimated cost of \$1.5 million, the Steel and Tube Div. of The Timken Roller Bearing Co. will install a new piercing mill at its Gambrinus location. The bulk of the work is expected to be done by July 1959. New equipment is part of the \$51 million expansion and modernization program taking place during the next 5 years.

**Old Timer Is Back**—"Old Faithful," a steelmaking pioneer, took its first vacation in 52 years. After rejuvenation, it's back at the old stand making steel again. "Old faithful" is an electric motor—the first to drive a rolling mill. It was installed in the 30-in. universal plate mill at U. S. Steel's South Works in 1906.

**New S-P Office**—The S-P Mfg. Corp., Solon, O., has opened a new branch sales and service office in Detroit, at 16801 Wyoming Ave., Detroit 21. The company makes hydraulic and air cylinders.

**Well Told Tale**—Motion pictures sponsored and distributed by U. S. Steel Corp. were seen by nearly 12 million people during the first six months of 1958. A report on the operation of the corporation's five film distribution centers showed 11,601,764 persons in attendance at 31,201 showings.

**German Subsidiary**—Ex-Cell-O Corp., Detroit, has acquired a machine Tool firm in Goepingen, Wuerttemberg, Germany. It will operate as an independent subsidiary. It produces a line of lathes, medium size planers and textile looms.

**Taking Aim**—A new advanced weapon systems (AWS) group has been formed by Philco Corp.'s Government and industrial Div. to study and formulate new and advanced weapon systems to meet future military requirements.

**Now in Nashville**—Aluminum Co. of America has established a resident sales office in Nashville, Tenn. It is located in the Wilson-Bates Building, 3813 Hillsboro Rd.

**Rubber in Australia**—Organization of B. F. Goodrich Australia, Ltd., has been announced in Akron, O., by W. C. Gulick, president, International B. F. Goodrich Co., division of The B. F. Goodrich Co. Associated with B. F. Goodrich in the new company will be Ampol Petroleum, Ltd., and other Australian investors. Construction of a plant near Melbourne, Victoria, for the manufacture of tires, and other products, will be started before Jan. 1.

**Controls Tension**—Exact tension regulation of extremely thin foil gages is an outstanding feature of four new mills that recently went into operation at the Reynolds Metals Co. plant, Louisville, Ky. New foil mills, each rated at 3,000 ft per min., produce Reynolds Wrap and other foil products. Electrical equipment was furnished by Allis-Chalmers, Milwaukee.

**Ohio's Share**—Forty firms in Ohio were listed among the 1,209 companies in 32 states which have supplied raw materials, parts, equipment or special services to the Atlas intercontinental ballistic missile program. The report of Atlas "primary suppliers," was released by Convair (Astronautics) Div. of General Dynamics Corp., which builds the missile for the Air Force.

**Inland Buys Gabriel**—Inland Steel Products Co., subsidiary of Inland Steel Co., has purchased the tooling and machinery of the Gabriel Steel Co., Detroit. Gabriel will continue in operation until Sept. 30, after which its sales and production will be assumed by Inland and transferred to Inland Steel Products at Milwaukee.

**Aluminum Pioneer**—Edgar H. Dix, Jr., asst. director, research, Aluminum Co. of America, New Kensington, Pa., and recognized internationally as the dean of aluminum metallurgy, has retired. Mr. Dix is directly or indirectly responsible for the development of the majority of aluminum alloys used today, which now number 70.



# DE LAVAL-STOECKICHT

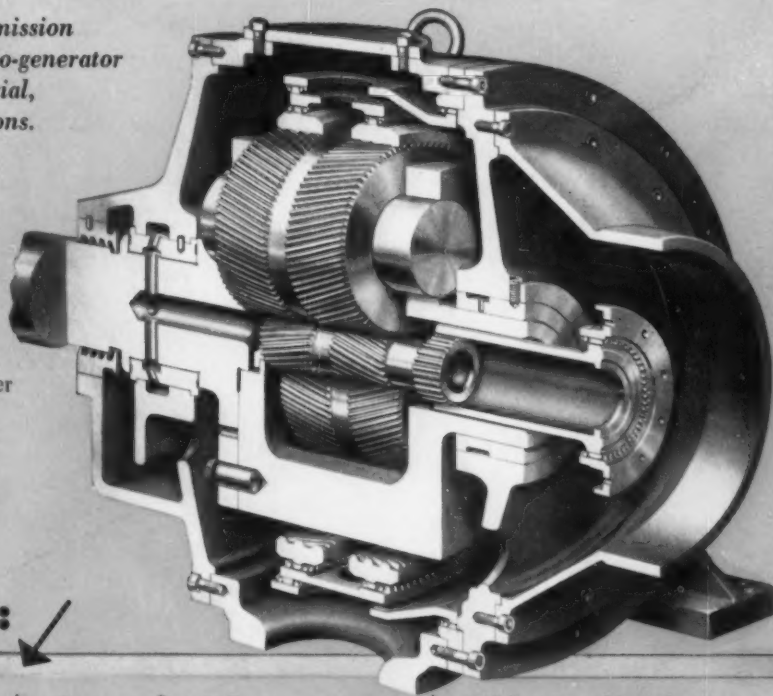
## PLANETARY GEAR

*...for high speeds...high horsepower*

**Proved in hundreds of installations abroad  
totalling over 3,000,000 horsepower—now available in America!**

*For all high torque power transmission applications such as pump turbo-generator and compressor drives in industrial, municipal and marine installations.*

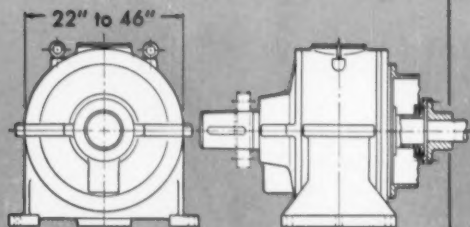
This cutaway view of the De Laval-Stoeckicht Planetary Gear shows how it provides flexibility for proper load distribution throughout the gear members. The thoroughly proved and tested design is completely reliable in transmitting high horsepower for high speed applications. • Highest efficiencies (98% or higher) ... no high speed bearings ... less friction losses.



### Check These Advantages:

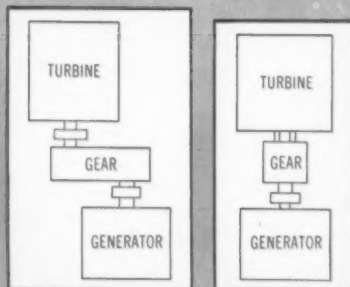
#### Small Size—Light Weight

Compact—low weight per hp. Sizes range from 22" to 46" in diameter, depending on horsepower requirements. Example: 5000 hp planetary unit weighs 1700 lbs. against 6000 lbs. for conventional gear.



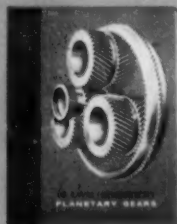
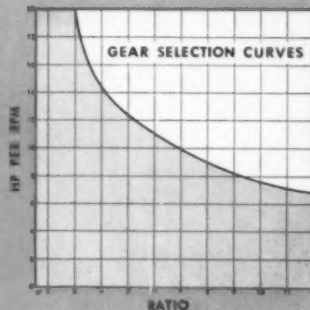
#### Convenient Arrangement

Co-axial or "in-line" arrangement of gear members takes up far less space than parallel axis gears of equivalent horsepower rating.



#### Wide Application

Capacity range shown in shaded area on chart below. For other applications, contact your De Laval Sales Engineer.



For further details,  
write for Bulletin 2400.



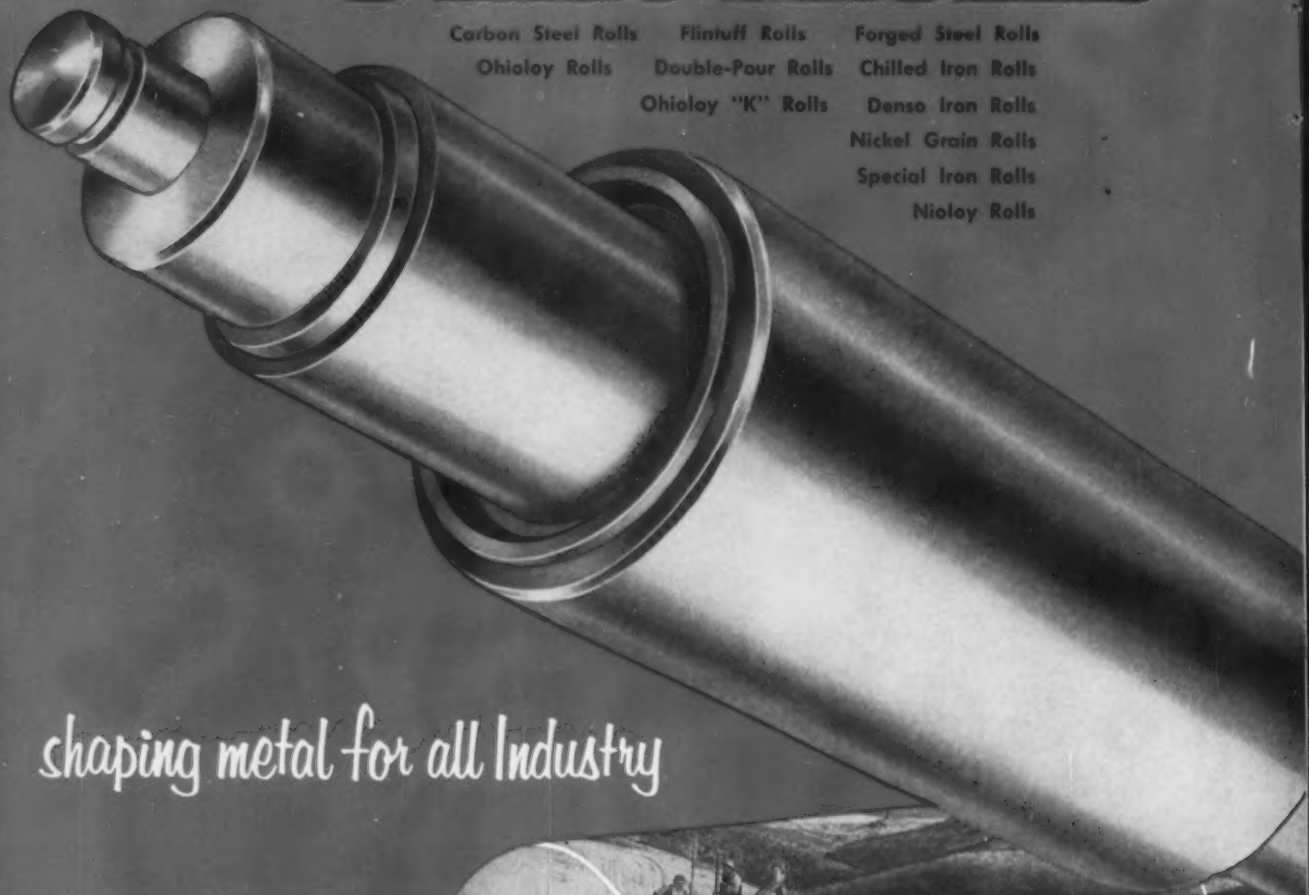
**DE LAVAL**

*Steam Turbine Company*

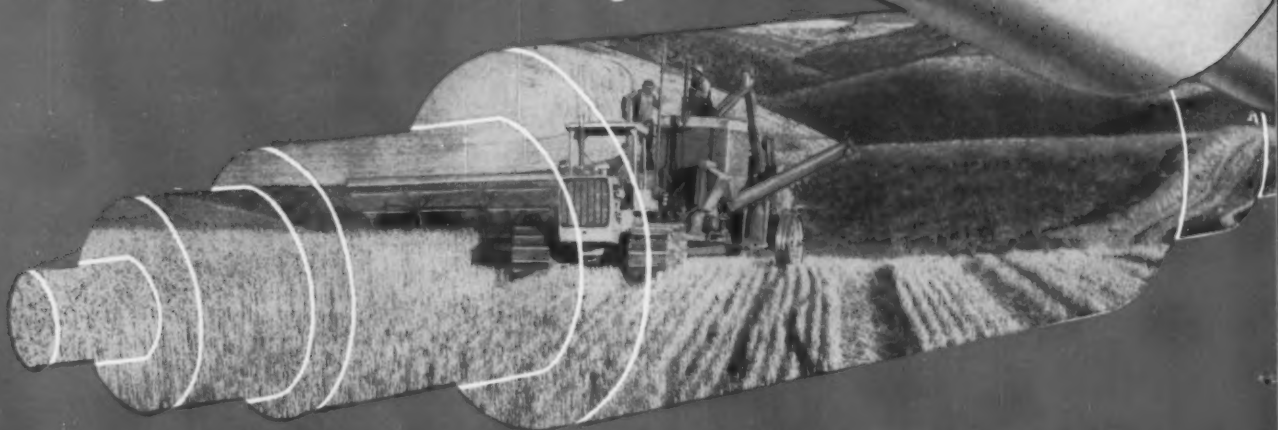
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Ohioley Rolls    Double-Pour Rolls    Chilled Iron Rolls  
Ohioley "K" Rolls    Denso Iron Rolls  
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Special Iron Rolls  
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LIMA, OHIO

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**J. H. Myers**, appointed vice president, marketing, Acme Steel Co., Chicago.

**E. Veselik**, elected president, Calumet Steel Castings Co., Hammond, Ind.; **C. J. Masepohl**, vice president; **W. F. Jicha**, treasurer; **C. K. Garrison**, secretary; **R. J. Pennington**, asst. secretary and treasurer.

**J. S. Jackson**, elected president, Shepard Niles Crane & Hoist Corp., Montour Falls, N. Y.

**Dr. W. H. Schuette**, elected vice president, The Dow Chemical Co.

**Eustace Lingle**, named vice president, industrial sales and education, Oakite Products, Inc., New York.

**A. C. Whitaker, Jr.**, appointed director, Iron Ore Procurement, Wheeling Steel Corp., Wheeling, W. Va.



**G. F. Griffiths**, appointed executive vice president, commercial, Acme Steel Co., Chicago.

**W. P. Youngquist**, named assistant to vice president, commercial, Jessop Steel Co., Washington, Pa.

**G. M. White**, appointed plant manager, Pittsburgh plant, Heppenshall Co.

**Eric Eckberg**, named vice president, sales, Union Spring & Mfg. Co., New Kensington, Pa.; **C. A. Rauth**, appointed sales manager of the subsidiary, Biggs Steel Foundry & Fabricating Co.

**D. F. Adams**, appointed vice president, sales, Colson Corp., Chicago.

**Frank Mears**, named consumer sales manager, Industrial Fastener Div., Pheoll Mfg. Co., Chicago.

**D. F. Ross** and **H. L. High, Jr.**, named Ohio branch managers for Dayton and Cincinnati respectively by The Carpenter Steel Co., Reading, Pa.

**J. C. Ferguson**, appointed director, industrial relations, Superior Steel Div., Copperweld Steel Co., Carnegie, Pa.

**J. K. Schultz**, appointed Philadelphia district manager, Pangborn Corp., Hagerstown, Md.



**A. J. Raymo**, appointed factory manager, Eddystone Div., Eddystone, Pa., Baldwin-Lima-Hamilton Corp.

**J. M. Childs** and **S. F. Madden**, promoted to asst. managers, Steel Sales Div., Firth Sterling Inc., Pittsburgh.

**C. M. Heath**, appointed director, labor relations, Kaiser Steel Corp., Oakland, Calif.

**E. G. Rowlett**, assigned to the Los Angeles office as manager, The Torrington Co.; **J. H. Williams**, becomes assistant to the sales manager, Bantam Bearings Div., South Bend, Ind.; **John Heyvaert**, pro-



**E. H. Hodgson**, promoted to sales manager, Worm Gear Jack Div., Duff-Norton Co., Pittsburgh.



**J. C. Richards, Jr.**, named vice president, sales, B. F. Goodrich Industrial Products Co., Akron, O.

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**THE WHELAND  
COMPANY**

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moted to district engineer in Davenport; **Ron Peterson** and **Norman Cook**, assigned to the Milwaukee and Pittsburgh office respectively.



**W. R. Comber**, appointed manager, Reynolds Metals Co.'s aluminum extrusion plant, Grand Rapids, Mich.

**E. E. Kennie**, named coordinator of engineering and manufacturing, Lift Table Div., Southworth Machine Co., Portland, Me.

**R. P. Gehring**, appointed sales manager, Cayuga Machine & Fabricating Co., Inc. of Depew, New York.

**J. R. Burwell**, appointed manager, government sales, Olin Aluminum, Metals Div., Olin Mathieson Chemical Corp.



**R. G. Allen**, elected to the board of directors and the executive committee, Bucyrus-Erie Co., S. Milwaukee, Wis.

**L. F. Kreske**, appointed Chicago area sales representative, Wire Rope

## How to measure

*Now* is the time  
to take a  
long, hard look

A continuous furnace is more than just a brick-lined structure built to heat a material; it is a processing tool.

Like all processing tools, it must be evaluated on an overall basis. Fuel consumption and efficiency may be completely outweighed by many more-important economic factors centering around your workpiece, your total production program, and your work force.

Your evaluation may well prove that an investment now in Selas continuous heat processing will bring immediate returns in reduced costs and improved product quality.

To help you take this long, hard look at your heat processing equipment or requirements, Selas offers these 15 evaluation factors:

- Labor requirements
- Material saving
- Material handling
- Floor space
- Process coordination
- Temperature control
- Fuel efficiency
- Product value
- Equipment flexibility
- Automatic operation
- Product quality
- Production requirements
- Work in process
- Human element
- Maintenance

The factual report on the facing page tells how a manufacturer of air conditioners took this long, hard look at return-bend brazing. Every evaluation factor proved important; reduced labor requirements alone paid for the Selas automatic brazing machine in 3½ months.

See Selas Heating in Action  
at the  
Metal Show  
Booth 1924



## the real cost of automatic heat processing

... here's how one SELAS installation stands up under that "long, hard look!"

This specially-designed, custom-built Selas machine silver-brazes pressure-tight joints on air conditioner coils — at production rates — without damage to easily-melted aluminum fins.

Yet heat input is sufficiently high to overcome, during the brazing cycle, the natural tendency of heat exchangers to draw heat away from joint areas. Previous torch method required four highly-skilled workers to equal machine's designed rate of output.

### Labor Requirements

One worker operates this Selas Gradation® brazing machine. Labor cost is now about 20¢ per coil. On a 2-shift-per-day basis, the saving in labor alone paid for this Selas unit in 3½ months!

### Material Saving

Preplacing of preformed silver alloy rings for automatic brazing assures correct amount of brazing alloy. Hand-brazing invariably results in considerable excess fillets, wasting of costly alloy.

### Material Handling

Since the Selas unit is actually a machine-tool type of equipment, it may be located advantageously within the entire production process.

### Floor Space

Like all Selas automatic brazing machine-tool type of equipment, it may be cupying only 4 feet by 8 feet of the assembly area.

### Process Coordination

Selas designed and built this machine to meet and keep pace with definite production goals set by the manufacturer of air conditioners. Component by component, operation by operation—the machine is coordinated with the assembly-line type of production.

### Temperature Control

Precise control of heat release rate and exposure time produces uniformly high quality brazing throughout 80 joints of each coil assembly.

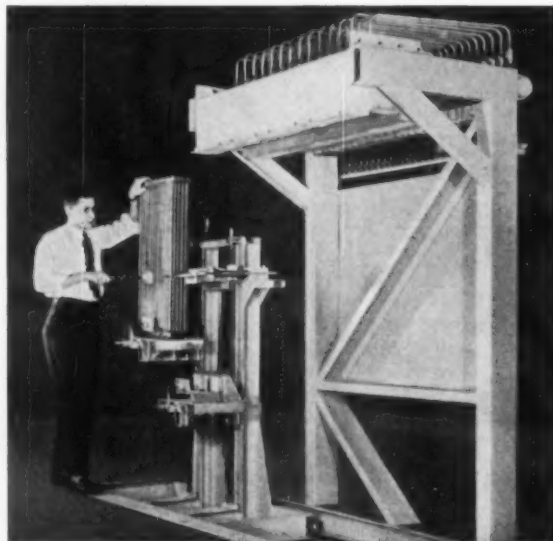
### Fuel Efficiency

Selas machine uses 200 cfh of natural gas, premixed with air by Selas Combustion Controller. Fuel cost is about ½¢ per coil. Any regular fuel gas can be used. Elimination of bottled oxygen and acetylene resulted in direct fuel cost savings sufficient to pay for Selas equipment in 4½ months!

### Product Value

Using the workpiece value at time of brazing, the coils brazed in only 31 hours are worth more than the cost of this Selas machine!

Employing automatic cycling and Duradant® gas-air burners, this Selas machine silver-brazes tube return bends to copper tubes of aluminum-finned coils at rate of 30 coils per hour.



### Equipment Flexibility

Versatility inherent in all Selas automatic brazing machines makes possible the brazing of a variety of workpiece sizes with simple adjustment of fixtures. This machine handles assemblies up to 5½ feet high.

### Automatic Operation

Once loaded, workpieces are carried automatically through the brazing cycle. All the operator does is load and push the "Start" button. He is free then to assemble the next coil while the machine completes the brazing.

### Product Quality

Each of 80 joints is Selas-brazed tight and leakproof to withstand Freon pressures in excess of 100 psig.

### Production Requirements

To keep pace with manufacturer's overall plant production, this Selas machine was designed and custom-built to braze 30 coils per hour. This rate matches production accomplished previously by 4 skilled workers.

### Work in Process

At the rate of 30 coils per hour, only one coil is in process at any one time. This represents a 300% reduction in in-process inventory.

### Human Element

The skills are built into the machine. Production of brazed coils with all joints pressure tight at rate of 30 coils per hour is not dependent upon ability, judgment or speed of the operator. Actually, the machine paces the operator.

### Maintenance

Rugged, welded construction makes for easy, infrequent maintenance. Each machine is factory-tested under production conditions. Each machine is set-up and started-up under Selas supervision in the customer's plant. And, since no operating equipment is better than the service available, Selas stands ready, day or night, year round, to service its equipment on call.

\* \* \*

For case histories covering heat processing operations in steel mills, for heat treating, heating for hot working and brazing, send for reprint "An Economic Appraisal of Continuous Heat Processing." For additional brazing information, ask also for Bulletin "Production Brazing and Soldering," and reprints "Gas-fired Machine Brazing" and "Mechanical Heating puts Brazing on the Production Line." Address Dept. 19, Selas Corporation of America, Dresher, Pa.

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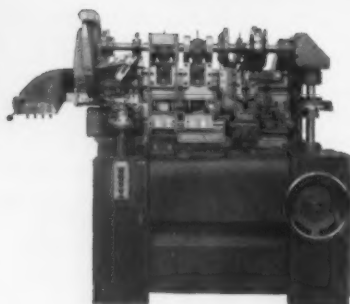


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**E. L. Wilson, Jr.**, appointed manager, Eastern district, Metal Products Div., Koppers Co., Inc., Baltimore, Md.

**J. H. McWilliams**, appointed manager of ore exploration, Mining Div., Aluminum Co. of America, Pittsburgh; **J. M. Tarter**, appointed eastern traffic manager.

**R. O. Oyler**, will become director of sales, The Bunting Brass & Bronze Co., Toledo, O.



**N. V. Chehak**, named sales manager, Link-Belt Speeder Corp., Cedar Rapids, Ia.

**C. H. Sanders**, appointed Southwest district manager, The Cooper-Bessemer Corp., Mount Vernon, O.

**N. R. Crum**, appointed manager, Los Angeles, Calif., office, Lunkenheimer Co. of Cincinnati, O.; **J. P.**



## Big warehouse keeps warm with four heaters

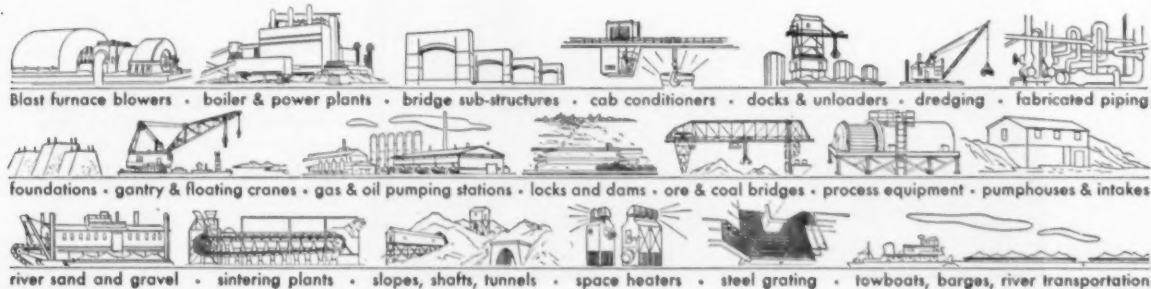
This 79,000 square foot warehouse of the C. A. Turner Company, Rankin, Pa., has high roof areas and large access doors. Yet, only four Dravo *Counterflo* heaters were needed to maintain a 68° comfort level during last January's severe cold spell with its frequent sub-zero temperatures. Fuel costs for the month were 7/10¢ per square foot!

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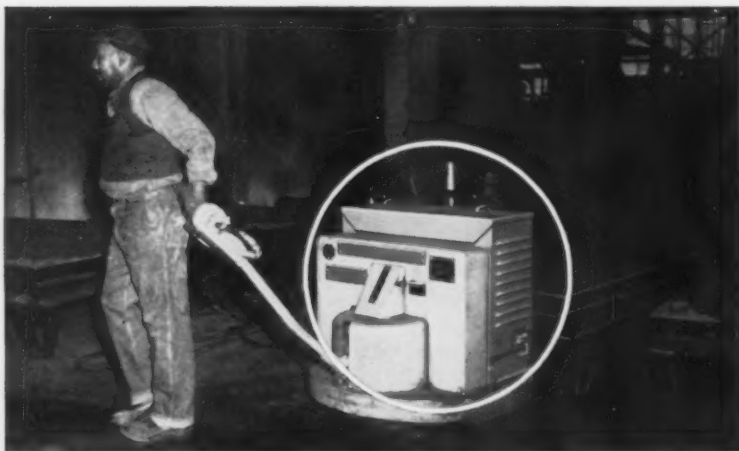
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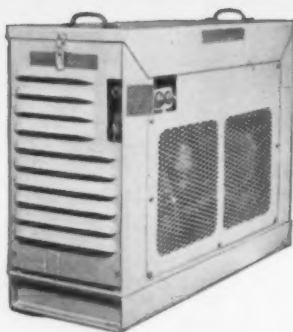
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**Dr. J. S. Mackay**, promoted to manager, general research, Research and Development Dept., Pittsburgh Coke & Chemical Co., Pittsburgh.

**H. J. Calnen**, named Eastern representative, The Chas. Taylor Sons Co., a subsidiary of National Lead Co.

**R. T. MacNaughton**, appointed asst. mill metallurgist, Copperweld Steel Co.

Following appointments are at the Pittsburgh headquarters of U. S. Steel's American Bridge Div. **C. S. Shepherd**, appointed asst. director, purchases, Pittsburgh; **O. H. Ormsby**, chief engineer-facilities and specialties at Ambridge, Pa., plant; **G. P. Willard**, appointed asst. district engineer in Pittsburgh.

**B. S. Yaffe**, named technical service engineer, Defense Products Dept., Callergy Chemical Co., Pittsburgh.

**G. G. Mead**, appointed chief industrial engineer, and **D. G. Hablett**, product engineer, Vulcan Mold & Iron Co., Latrobe, Pa.

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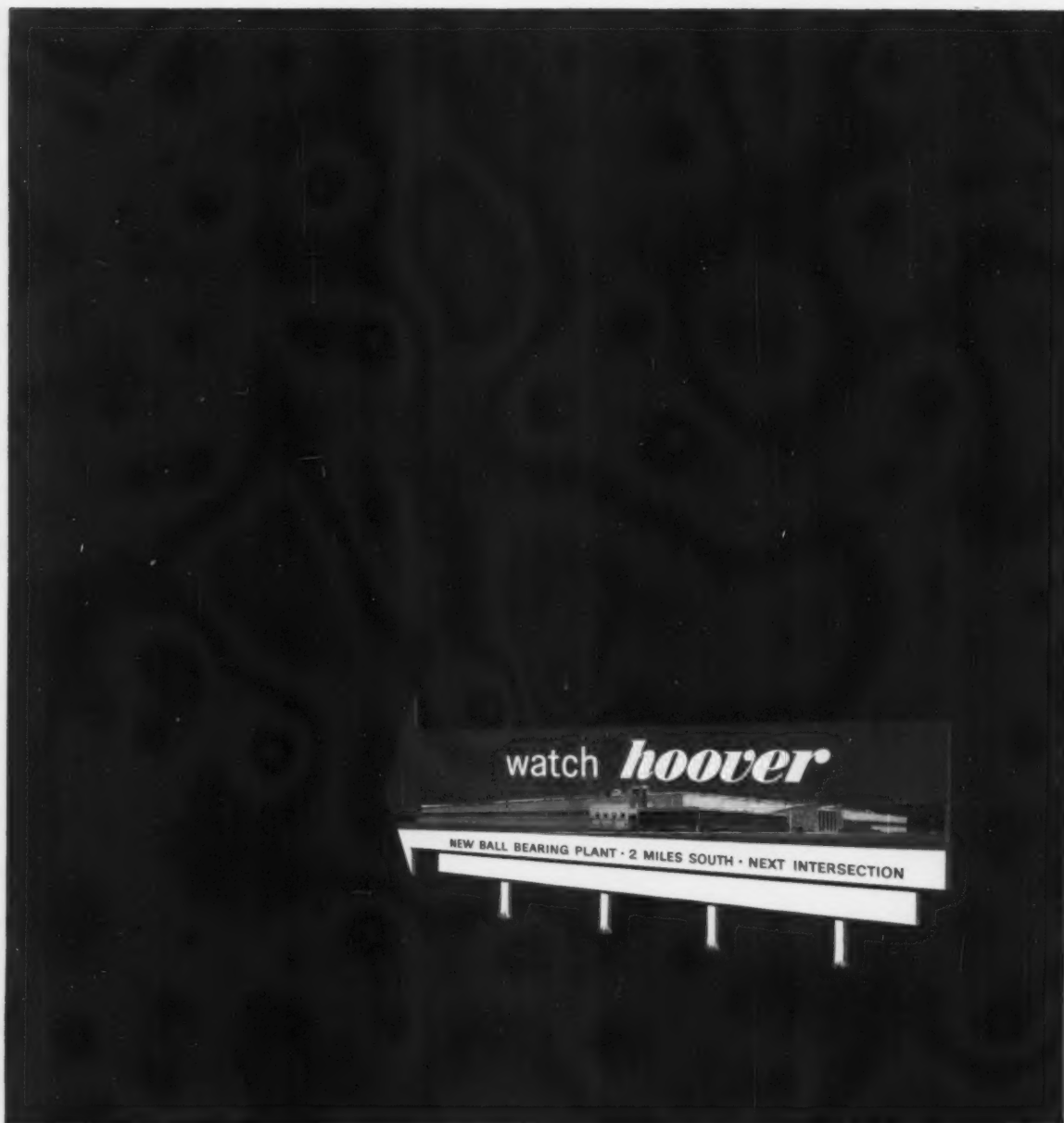
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# How Good Plant Layout Cuts Costs

By J. L. Martin—Executive Consultant, Trundle Consultants, Inc., Cleveland

**The way machines are placed and materials flow to and from them can be a big factor in operating costs.**

**Is your plant layout as profitable as it might be?**

**Here's a checklist of danger signs, and how to go about correcting them.**

- The quality of plant layout can spell the difference between a profitable operation and a costly one. Of the facilities and functions affected by layout, machine arrangement and materials flow are perhaps the most important. Together, they affect a big chunk of manufacturing costs. Materials handling alone eats up about 25 pct of every payroll dollar disbursed by American industry.

Too often, plant layout improvement is thought to be solely an engineering problem. Actually, management must first decide whether piecemeal improvement or an overall layout change is needed.

**Find Trouble Spots**—In considering piecemeal change, determine whether there is one area or operation which is particularly troublesome—labor difficulties, high overtime, lots of rejects, or excessive machine downtime.

Look closely at the departments that both precede and follow the troublesome one. The trouble may very well be here. Investigate time standards in these other areas for any sign of noncompliance.

Look at process routing — the road map that tells the travel direction of material in various manufacturing steps. Symptoms are not localized but appear in many differ-

ent departments; they may indicate a comprehensive re-layout job is necessary.

But whether piecemeal or overall re-layout is necessary, management should keep two basic things in mind: Evaluate each layout change before undertaking it to make sure it will improve profit or add to some other key corporate objective. After the change has been made, see that it's doing the job it was supposed to do.

**Big Benefits**—Many advantages can accrue. One midwestern appliance firm recently achieved three big benefits from improved layout: less materials handling labor, amounting to a big 50 pct cut on

one change alone; a 67 pct net saving of floor area; and fewer order shortages because the new layout helped keep better track of parts.

Or take the case of Zippo Mfg. Co., Bradford, Pa. Using some of the techniques in the accompanying boxes, Zippo was able to trim its materials handling costs by \$45,000. At the same time, production was increased in its main inside assembly area, its packing department, and its outside assembly area.

**Spread Out**—Zippo's processing begins at its Congress St. plant, located two or three miles from main assembly. There, rolls of stainless steel go through punch press operations, soldering and buffing to form

## How to Tell a Poor Layout

### Material Shortages

Materials arrive late at machines. Too much time is taken to unload trucks or move materials from storage to production areas.

### Long Processing Cycles

When material stays in production too long despite allowances for fatigue and rest periods.

### Retraced Flow Lines

Materials travel farther than the combined length and width of the shipping, receiving and storage departments, plus the individual machine areas.

### Mounting Costs

Despite use of lift trucks and other mechanized handling equipment, materials handling costs keep mounting.

### Isolated Changes

Small layout changes made over a period of time haven't been integrated into an overall flow pattern.

### Material Build-ups

Raw or semi-processed materials clog aisles and other traffic arteries. Finished goods pile up on shipping platforms.

# Ways to Plan for Better Layout

## Start With an Activity Drawing

Pinpoint areas occupied by each activity. Locate transportation aisles. Show fixed materials-handling equipment such as cranes, elevators, conveyors.

## Make Flow Drawings

Trace movement of materials and spell out quantities and frequency of moves. Eliminate nonessential moves.

## Make a Plant Schematic

Do this after you've decided on revised floor space needs for each department. Layout scale is important—use the largest possible.

## Gear Layout to Main Products

Don't let flow of special items figure too heavily. If you must improve their passage make changes that won't conflict with main production movements.

## Discuss Proposed Changes

Get the thinking of supervisors in departments involved. Their approval of any layout change is a must.

## Figure Overall Costs

Check alternate plans. Look for highest return on investment.

bare shells for pocket and table lighters.

At the main assembly area workers insert the various parts—lighter wheel, cam spring, cam, wick and cotton, flint and flint spring. After final inspection in the packing department of the Congress St. plant, the inside unit is fitted to the outside case, and the finished product goes back to the packing department for shipment.

**Too Much Handling**—Sometime ago, a plant-wide survey showed the company was operating well below potential efficiency. The study revealed some costly trouble-spots, mainly in excessive handling.

For example, the main assembly area where workers processed the inside units consisted of one long bench with workers seated next to each other. After completing a particular operation, a worker would push individual lighters to the next work station.

A similar arrangement existed in

## Simple Change Has Big Effect

## From Crowded Setup . . .



**POOR FLOW:** Main assembly at Zippo had workers at long bench pushing parts from one to another.

the packing department. And in the outside assembly area, there was an undue amount of waiting time as well as excessive material handling.

**Changes Add Up**—The company decided to revamp its plant layout. In so doing it hitched its layout scheme to a wage incentive plan, developed after studying each operation and setting up new standards for each job.

The company rearranged its personnel in the inside assembly area. Individual benches were substituted for the one long bench, stationing workers in back of each other. A new conveyor line was placed in the center so workers were located on either side of it. This cut down on handling.

Since a 25 pct saving in floor space was achieved by the layout change, it was also easy for Zippo to rearrange machinery. Use of the conveyor simplified the setting up of inventories between operations. Zippo realized a production in-

crease of 33 pct in this area alone.

A similar rearrangement of personnel in the packing department resulted in a production increase of 35 pct. In contrast with the old setup, where packers had to rise and place shipping containers on a bench, a new conveyor eliminated unnecessary motion and resulted in greater efficiency.

**Lops Off Miles**—At the Congress St. plant, an annealing furnace for drawing operations on outside cases was too far away from punch presses and other machines.

The furnace and presses were rearranged. Now, material for the lighter bottom travels only 3½ miles a day, compared with 12½ miles under the old layout. Material for the top of the lighter now travels 7 miles a day, compared with 25 miles under the earlier setup.

In the original plant setup, material was transferred to tote boxes, fed to machines, transferred again to tote boxes and then back to machines. A moving conveyor belt

eliminated this waste motion. Inventories also were built up between operations to reduce waiting time. The result is that Zippo enjoys a production increase of 49 pct in this assembly area.

Average overall production increase for the two assembly areas and packing department comes to 39 pct.

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**This is the third** of a number of articles on the various approaches management can take toward cutting costs.

Future subjects to be covered by Trundle Consultants will include quality control and maintenance.

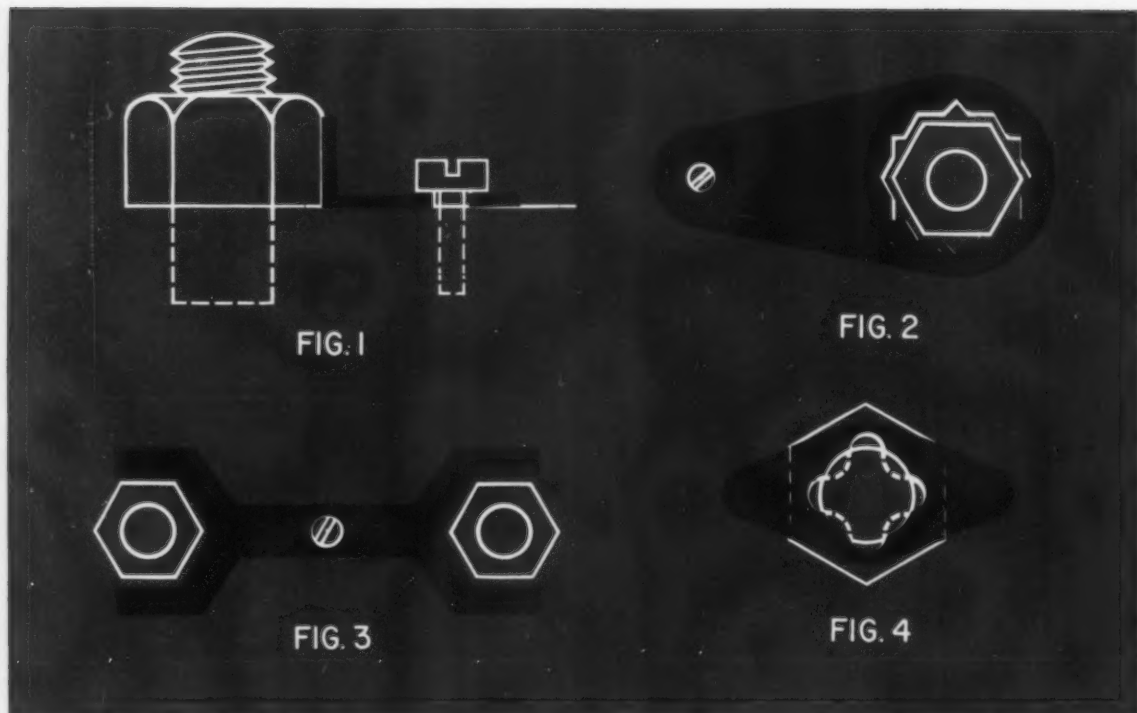
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## ... to Fast-Moving Line



**SMOOTH TRAVEL:** Workers now sit at individual benches with conveyor between. Output is up 33 pct.



**REUSE AT WILL:** Auxiliary devices provide locking action without having to modify standard screws and nuts.

## Ways To Keep Fasteners Locked

By Federico Strasser—Consultant, Santiago, Chile

**Once a fastener is tightened, you want it to stay put.**

**It pays to keep a selection of locking methods in mind to cope with many situations.**

**Here are a number of the common ways, and perhaps some new techniques to add to your list.**

■ Whether it's due to impact, vibration or other forces, bolts, screws and nuts have a way of loosening. Loose fasteners lead to poor operation or complete failure with injury to personnel and machines.

Fortunately, there's a wide range of methods for securing fasteners.

Each case dictates the choice of locking method.

**Classify Techniques** — It's convenient to put the many locking methods into categories. It eases the job of selecting the right technique for a given situation.

Whether or not the locking device is reusable is the main classification. A method either can be reused indefinitely or at the other extreme can be set up as a permanent lock.

A secondary classification considers the amount of modification necessary to provide locking for standard components. The range here is from the use of standard parts without any alterations down to use of fasteners of special de-

sign, either shop-made or commercially produced.

**Unlimited Reuse** — The one method with unmodified standard parts alone is the common use of a jam-nut or locknut. It's simply a standard nut of less thickness than the ordinary nut. According to recent practice, it's put between the regular nut and the work itself.

Stop plates form an auxiliary means of locking standard parts. The simplest form is a small square screwed on the workpiece so that the vertical leg of the square contacts one of the nut faces (Fig. 1). Or it can be a steel block screwed against a face.

A safer design of stop plate is a flat piece of steel sheet shaped to



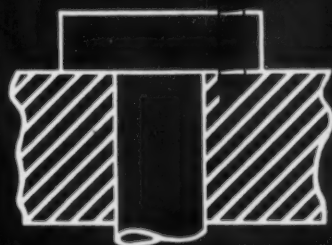


FIG. 5

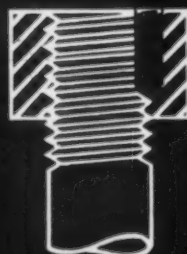


FIG. 6

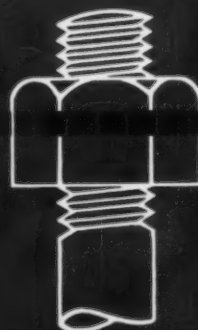


FIG. 7



FIG. 8

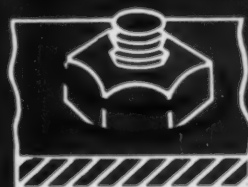


FIG. 9

**MODIFY STANDARD:** Set screws, pins, and wire binding can all be fitted to standard screws and nuts.

hold the nut on four sides. A further extension of this is a hexagon shape to surround the nut.

While the latter two devices allow six positions, an opening with 12 sides (Fig. 2) permits 12 working positions and thus finer adjustment for screw tightening. Any of these designs can be employed for pairs of adjacent nuts, thus saving labor and material in the construction of stop plates (Fig. 3).

A combination washer - locknut made of sheet steel (thickness  $1/5$  to  $1/3$  of bolt thread pitch) has no threads (Fig. 4). Its hole of slightly more diameter than the core diameter is generally square with inwardly rounded sides.

It is put on the free end of a bolt after the regular nut has been screwed on. The external form of the washer is made for easy handling.

**Modify Parts**—The standard bolt or screw can be modified in quite a variety of ways to provide locking. Setscrews, pins, and wire binding are all parts that can be fitted for the job.

For setscrews you can drill and tap the nut radially and also spot drill the bolt at the corresponding point (Fig. 5).

Another arrangement is to put the setscrew through the nut or bolt head into the workpiece. When a bolt end is flush with the nut and bolt, the setscrew can be put longi-

tudinally between the nut and bolt (Fig. 6).

Pins can be employed in various manners. Where a tightly fitting round pin is inserted through the nut and bolt, pin diameter should be  $1/4$  bolt diameter (Fig. 7). Better is a tapered pin in a matching conical hole.

For light duty, instead of pins,

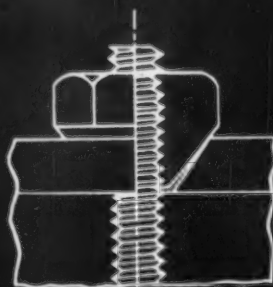


FIG. 10

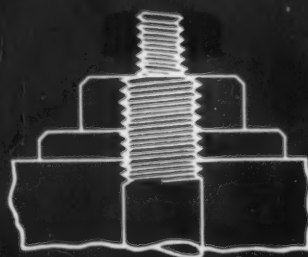
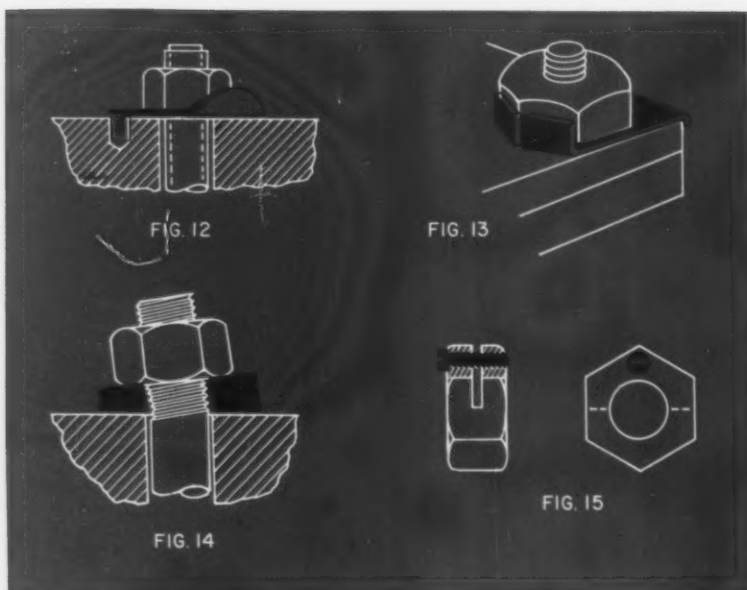


FIG. 11

**DESIGNS FOR THE SHOP:** With male taper slightly larger than female, extra pressure is created. Also effective is a left hand nut on a bolt.



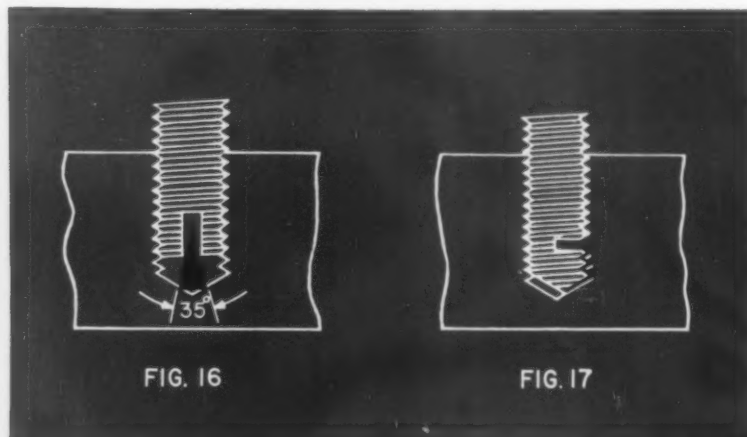
**REUSE LIMITED:** While these locking devices can be disassembled, they're primarily intended for permanent fastening.

wire (loosely fitting in the hole) or cotter pins can serve adequately.

**Wire Forms Lock**—For locking screws, wire binding can be simply passed through a hole drilled in the screw head (Fig. 8). For locking nuts it's unnecessary to drill through the bolt: an offset hole in the nut is sufficient for receiving the wire. A simpler method yet is to make a slot in the nut, which is closed after inserting the wire.

Steel wire (piano wire) provides a simple means of locking. With a couple of turns of the steel wire wound around the bolt, the upper end of the wire, bent at a right angle, is inserted in a hole in the side of the nut, while the lower end is made fast to the workpiece (Fig. 9).

Tightening of the nut opens the wire, but loosening the nut closes the wire on the nut and prevents further unscrewing.



**FOR SECURE STUDS:** Conical plug (Fig. 16) expands threads against bottom of hole. Threads below slot (Fig. 17) bind together for locking.

**Shopmade Locks**—A steep-angle taper is always a good means of locking. One way is to provide a long hexagonal nut with the bottom half tapered. The taper matches a countersunk conical hole, which can be in the workpiece or in a supplementary nut or washer. This arrangement can be reversed with the upper locknut carrying the female taper.

Whatever the design, slotting of the nut which carries the male taper will increase locking action. Another improvement is to make the female taper a small fraction of a degree smaller than the male taper. It creates extra pressure between the nut and washer (Fig. 10).

By making the taper of a countersunk-head machine screw much smaller than the standard  $82^\circ$ , you will increase the locking action of the tapered section of the head. The angle can be  $60^\circ$  or even less.

Making a nut with off-angle and/or off-lead threads will provide a firm lock. Another method little known, yet effective, consists of reducing the free end of the screw and threading it with a left hand thread (Fig. 11).

**On the Market**—The familiar castle nut is one of the most common commercially produced special nuts. A hole is drilled in the bolt to receive a cotter pin or wire.

One of a large number of special locknuts is the split type which is tightened by a small screw in a tangential position.

There are dozens of other types all of which have these features in common: They eliminate the need for standard nuts and they don't require any machining of corresponding bolts.

**Limited Reuse**—Spring lock washers, made of sheet steel and hardened, are put between the bolt head or nut and workpiece. There are two basic forms: Split rings and closed rings with teeth, external or internal. Since there is actual chip formation when a screw connection with a spring lock washer is unscrewed, such lock devices should

be employed where the assembly is seldom unscrewed.

A large washer transforms easily into a stop plate by slitting so that a wing may be bent upwards. The washer itself is secured by forcing with a pointed punch a portion of its outer circumference into a hole previously drilled in the workpiece.

Instead of punching, a flap or tab can be used (Fig. 12). Also a small screw can be used to fasten the stop plate to the workpiece.

**Lock Against Workpiece**—When a bolt is near the end or corner of a workpiece, a simple rectangular stop plate can be bent over an edge or butted against a corner to provide locking action (Fig. 13). Where screws or nuts are located adjacent, double stop plates can be effective.

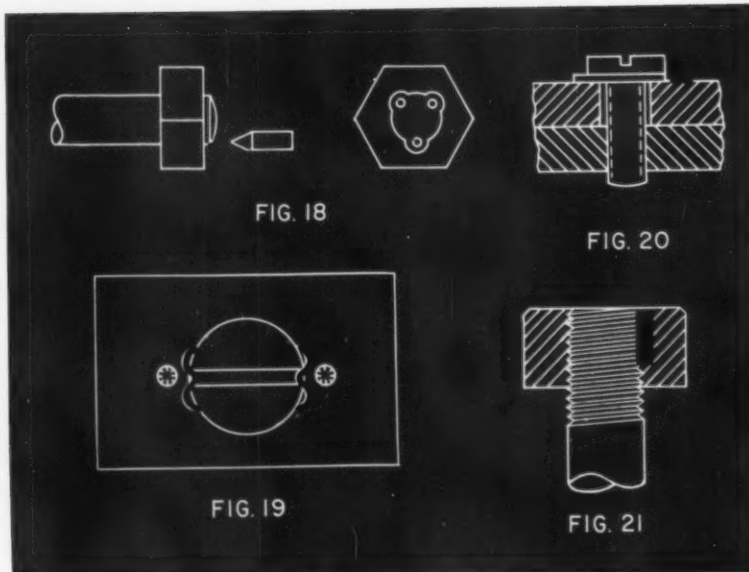
A standard washer, filed or machined to form a wedge-shaped cross section, provides a strong locking action between bolt threads and nut through the bending action on the free end of the bolt (Fig. 14). A bent washer or tapered lock-nut will do the same job.

By machining a flat surface or slot into the bolt and matching the stop plate hole with the bolt cross section, the stop plate can be made independent of any holes of the workpiece. The nut can be secured by bending the washer against one or more faces of the nut, as with other stop plate methods.

A nut can be simply modified for locking by making a radial slot with a hacksaw. After the nut is screwed down, you close the slot with a nail-set punch. To unscrew it's necessary to use a chisel to open the slot.

**Machine Screw Helps**—The use of a machine screw mounted to close or open the slot is an improvement on this method (Fig. 15). Instead of slotting a single nut, this method can also be modified by using a separate nut fitted with the screw to exert axial pressure between the two nuts.

A method involving the bolt alone is to drill a concentric hole



**LOCKED FOR GOOD:** The intent is to provide permanent locking of fastener with reuse considered rare if ever.

at the end of the bolt and make two cuts with a saw to provide four slots. A tapered pin driven into the hole will spread out the four sectors of the bolt end to lock.

If the concentric hole is tapered so that the remaining wall thickness of the bolt is small (0.10-0.12 in.), it's possible to do the same job without slotting the bolt end. A tightly fitting tapered pin exerts pressure to expand the bolt threads for locking action.

**How to Lock Studs**—There are a variety of means for locking studs. One simple way is to machine a tapered point to match a corresponding tapered hole at the bottom of the threaded hole.

Another way is to drill a small hole at the bottom of the stud and make four slots. A conical plug inserted in the hole will then expand the four sectors tightly against the hole threads (Fig. 16).

A simple method is make a transverse slot towards the end of the stud and file away the bottom of the stud on the opposite side. As the stud is screwed down the slot will close with screw threads tight against hole threads (Fig. 17).

**Permanent Lock**—With standard parts, peening or nicking the threads of bolt and nut together in two or three points is one quick method (Fig. 18). In the case of a countersunk-head machine screw, some of the surrounding metal may be forced into the two ends of the slot (Fig. 19).

Cement or paint applied on the bolt threads before seating the nut is another technique. Likewise a small few drops of solder will lock small screws and nuts (Fig. 20).

Application of acid is quite effective. After cleaning bolt and nut threads of all dirt, oil and grease, apply a few drops of sulfuric acid. On assembly, the acid will practically weld thread surfaces.

When bolt and nut end are flush, a longitudinal hole can be drilled between nut and bolt. A tight fitting pin will provide a secure lock (Fig. 21).

**Reprints** of this article are available as long as the supply lasts. You may obtain a copy from Reader Service Dept., The IRON AGE, Chestnut & 56th Sts., Philadelphia 39, Pa.

# Dip Brazing of Aluminum Pays With Accurate Assemblies

By E. G. Slotta—Manager, Microwave Shop,  
Government Mfg. Div., Raytheon Mfg. Co., Waltham, Mass.

**It takes more than just good fixtures to insure precision in brazing complex parts.**

**That's why there are many benefits in dip brazing.**

**The operator is relieved from the extra care needed in handling a hand torch.**

■ Microwave components are vital to a radar system and, next to the magnetron tube, are the heart of the unit—guiding and controlling the system's energy. Brazing of the

aluminum parts which make up these components used to be done by hand torch. It was a slow painstaking job, costly in manpower and money.

One of the biggest problems was maintaining quality. This problem has been solved at Raytheon Mfg. Co. by dip brazing.

**Cuts Brazing Time**—Dip brazing brings together aluminum parts submerged in a molten flux to form a finished assembly. It eliminates the possibility of damage from overheating. At the same time, it does

the job in about one-third the time required for torch brazing.

Parts are first given a thorough cleaning, as follows: Soak in aluminum cleaner, etch type (usually an Oakite bath). Rinse in clean cold water.

Dip 1-2 minutes in Alumatex acid No. 2 and rinse in clean water. Then dip 2 minutes in aluminum pickle M636, 3-4 lb per gal, at 180°F and rinse in clean water.

Dip again for 1 minute in Alumatex acid No. 2. Rinse and double rinse: first in hot water, then in cold water, and finally in hot water again, temperature 150°F, to remove traces of acid.

**Note Containers**—Alumatex acid No. 2 requires a Heil Rigidvin lined tank. Aluminum pickle M636 requires a ceramic crock suitable for hot sulfuric acid. A quartz electric heater can be used.

After cleaning, parts are brought together in a preliminary assembly and a filler alloy is applied. Both wrought and cast alloys are used.

Alloys for production runs at Raytheon are made up of 80-pct aluminum and 10-pct silicon. Alloys come in wire, sheet, and powdered form, 718 alloy being the most popular.

**Preheat Assembly**—The assembled part, held in a stainless-steel fixture, is placed in an oven preheated to about 950°F. Stainless steel is used because it's corrosion-resistant. If a mild steel were used, the resultant oxide would contaminate the bath and ruin the parts.

Preheating in the oven insures that the part will not appreciably reduce the temperature of the



**PREPARE WITH PASTE:** Microwave component receives braze paste prior to preheating and dip bath. The paste fuses joints on melting.



molten flux in the dip brazing bath. It also prevents the molten flux from freezing around the entire part—a condition which would occur if parts were brazed without preheating.

The salt bath, not the filler alloy, serves as a flux. This salt bath consists of molten chloride-fluoride.

The assembly is left in the preheating oven for 5 to 35 minutes—until a temperature of 950° to 1000°F is reached.

**Submerge in Salt**—The assembly is then removed from the oven and at once submerged into the molten salt bath accurately maintained at 1080° to 1085°F. Here, depending on size, it is held from 10 seconds to 3 minutes. After removal, the assembly is air-cooled to prevent distortion.

Final step is cleaning to remove fluorides. These active salts must be thoroughly removed to prevent future corrosion. It's done by etch cleansing and de-oxidizing.

Before dip brazing was adopted, four men were employed in hand torch brazing. Now, two men can maintain a production rate 50-pct above that of the hand brazers.

One typical operation involves a 17-piece aluminum component called a mixer. A stainless-steel fixture is used to hold the parts together.

**Paint with Paste**—Aluma braze in powdered form is mixed with water to form a paste. The paste is painted over the assembly and between the joints of each part in the fixture.

The paste melts at a lower temperature than the aluminum part so that when the fixture is submerged in the molten bath for 1½ minutes, all parts are fused. The filler material alloys itself to each piece of aluminum.

The dip brazing method at Raytheon results in substantial savings. In addition, the facilities of the brazing section have been thrown open to engineering groups for research and development work to bring engineering and manufacturing together.



**APPLY BRAZE POWDER:** Aluma braze, shaken into top and bottom headers of heat exchanger, seals off voids in dip bath operation.



**LOWER INTO BATH:** After preheat cycle at about 1000°F, part remains in hot-flux bath at 1080°F for 10 seconds. Bath is molten chloride-fluoride.

# Uses Grow for Ceramic Coatings

By F. D. Shaw—Vice President, Bettinger Corp., Waltham, Mass.

**A new technology is evolving around the use of ceramic coatings on metals.**

**The emphasis right now is on resistance to heat.**

**But there are other important ways in which coatings of this type help metals do more jobs.**

■ In recent months ceramic coatings have been successfully applied to an ever-wider range of metals. And they're going into more and more different applications.

One of the latest uses is the bonding of ceramic coatings to the new alloy magnesium-thorium. Lighter and stronger than either aluminum or magnesium, magnesium-thorium is in great demand for missiles and

rockets. A big drawback has been the alloy's relative softness.

Together with Convair Div., General Dynamics, Pomona, Calif., Bettinger Corp. has developed a ceramic coating that improves the tensile strength of magnesium-thorium. At the same time, the new coating increases the alloy's abrasion, corrosion and erosion resistance.

Other metals and other ceramic coatings have been combined with good results, improving the life and service of such diverse objects as jet-engine nozzles and coal chutes.

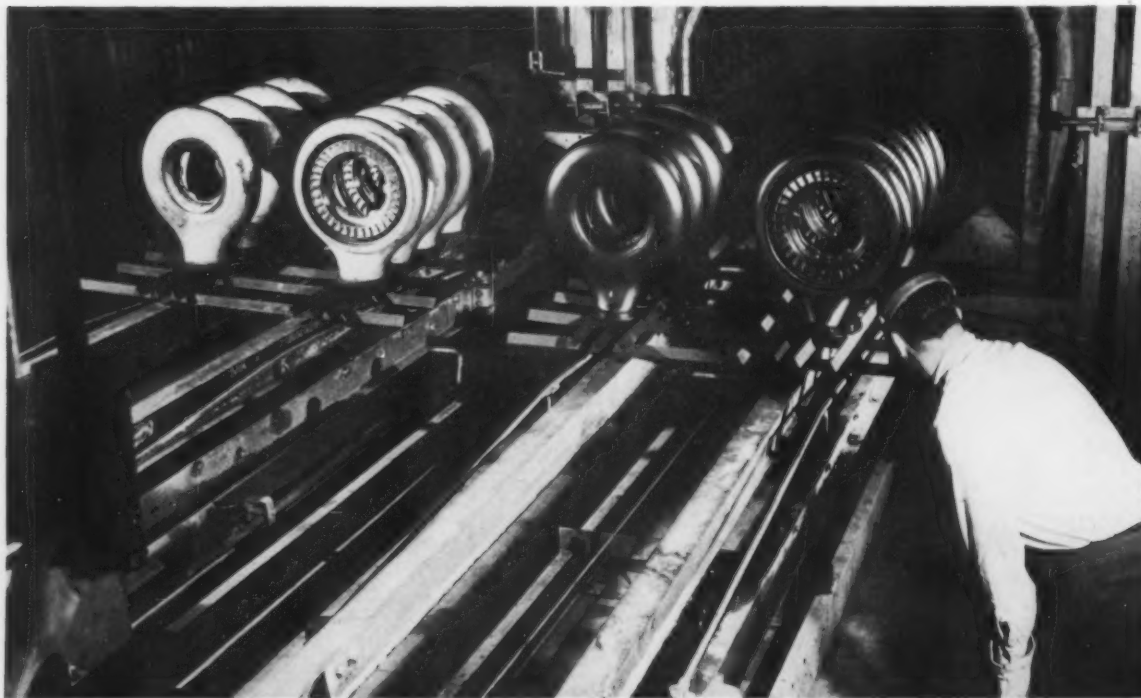
**Emphasis on Heat**—At the moment, greatest interest lies in coatings for use on metals at high temperatures. Bettinger fires coatings in its standard Becote series at 1950°F. This gives a ceramic-metal

combination that will withstand 2100°F for 100 hours before showing oxidation or burnoff.

Laboratory tests are being run which should result in coatings which will be able to handle brief heats up to 5000°F.

On alloys such as Inconel, Hastelloy, L-605 Nichrome and others which already have high resistance to heat and corrosion, ceramic coatings add still further to their useful lives at high temperatures. In many instances, refractories are added to standard coatings to gain greater heat protection. High-firing cobalt enamels are often used in very high percentages of alumina to obtain coatings with optimum properties.

**Big Breakthrough** — Quartz is used to give the coatings heat re-



**EXTRA PROTECTION:** High temperature ceramic-coated nozzle boxes for jet engines are fired at 1875°F.

sistance, but it often will not bond at high temperatures. This problem has been solved by making the bond with lower temperature coatings, then spraying the surface with alumina or some other refractory.

Depending on the choice of refractory, coatings can be made either highly reflective or highly emissive. Reflective coatings turn back some of the heat that would otherwise reach the metal, while emissive coatings help dissipate heat from metal. In many cases, reflective coatings reduce metal temperatures as much as 300°F.

Coatings with the highest reflectivity or lowest emissivity are those formulated with large amounts of dense white oxide and low glass content. Zirconium spinel and Treopax appear to be the best oxides for this purpose.

**Opposite Effect**—Coatings with high emissive and low reflective values, on the other hand, must be dark in color and have a rough matte surface. They must be thin—about 0.001 to 0.002 in. Nickel oxide, chromic oxide, ferrosilicon and chromide are commonly used in coatings of this type.

New super refractories have been developed from cermets, borides and nitrides. Zirconium boride, for example, has a melting point of 5540°F; and boron nitride melts at 5432°F.

**Main Approach** — At present, coating research is aimed at four major problems: abrasion, thermal shock, acid or corrosive gas, and dielectric strength. Each of these qualities can be formulated in the coating to a greater or lesser degree to meet specific needs.

Ceramic coatings have high resistance to abrasion, with values of 5 to 7 on Moh's scale of mineral hardness. A lot harder than brass, aluminum, copper and many forms of steel, the coatings can be given greater wear resistance by adding special abrasive resistants. Some coatings have the hardness of topaz.

To stand up under thermal shock and impact, coatings must be thin.



**EASY TO HANDLE:** Ceramic coating is spray-applied to the fire chamber of a residential-type furnace. It greatly extends useful life.

A standard test for coatings in this category is to heat the coated metal to 1700°F and then quench it through 10 cycles.

Ability to withstand fatigue is another quality ceramics impart to metals. Fatigue tests of coated samples on standard Krause machines at 1700°F result in average fatigue life of more than 1 million cycles. Under the same conditions, uncoated samples failed after 160,000 cycles. Similar results were obtained at room temperature.

**Corrosion Leads**—The greatest current use of ceramic coatings is for resistance to corrosion. Available in a wide range of acid resistance, the coatings are serving in mild organic acids, photographic solutions, food processing, flue pipes, industrial fans, oil refinery equipment, chemical pipelines, tanks, valves, and burner equipment. Special chemical wear coat-

ings will resist practically any solution short of hydrofluoric acid.

Dielectric strength is a little-known property of most ceramic coatings. Normally, those coatings which are high in lead content have the higher insulating values.

Thicker ceramics usually have greater dielectric strength. Where ceramics have a higher melting point, a thinner coating may be used. Certain formulas can give protection of 200 v for each mil of coating thickness.

And finally, ceramic coatings are versatile. With a few changes, the same coating that's used on a coal chute can increase the life of a launching platform for guided missiles. Other types can make auto mufflers last the life of the car. They can give new life and strength to everything from saw blades to pouring tanks for molten lead. At this point, there doesn't seem to be any end to the possibilities.



**TYPICAL SIZE:** Ferro coke is hard with excellent resistance to degradation in handling. Storage is easy.

## Treat Flue Dust to Recover Iron

By John Mitchell—Director of Research and

A. C. Sediachek—Works Manager, Everett Works, Eastern Gas and Fuel Associates, Everett, Mass.

**Effective use of by-products is a problem. You either have to have costly processing equipment or you end up with disposal at low prices.**

**This case however shows how benefits are gained from a simple method of returning blast furnace flue dust to system.**

■ Ferro coke, a carbonized blend of coal and blast furnace flue dust, turns out to be an easy, practical, and technically feasible way to use flue dust. Previously, a unit of iron in flue dust had to be disposed of at a very low price.

But put back into the furnace as ferro coke, this unit may be valued at the price of a unit of ore with added credit for reduction of oxides to metallic iron. It's a way of sintering, without a sintering plant, simply through using conventional coke ovens.

This is the experience at the Mystic Blast Furnace of Eastern Gas and Fuel Associates, Everett, Mass. At this integrated plant, a full year's production and use of ferro coke has recently been completed.

**Solution to Problem**—Eastern's reason for engaging in the manufacture and use of ferro coke is simple: Ferro coke turned out to

be a solution to the problem of what to do with flue dust.

Furnace operators everywhere face the problem of efficiently using soft, earthy ores. Efficient or not, the increasing use of such ores inevitably leads to increase in production of blast furnace flue dust.

At a large installation a sintering plant can be a good answer. This is particularly true if sintering is also applied to the ores or to ore-dust mixtures. However, a sintering plant is too expensive for a small operation and the flue dust is usually sold as a waste or by-product material.

**Experiments Show** — Eastern's operations and organization were suited for large-scale trial of the



ferro coke process. First, Eastern's Research Laboratory carried out extensive experiments.

Pilot-scale oven trials indicated that a carbonization blend of 80-pct high volatile coal and 20-pct flue dust would yield a coke of satisfactory properties. Full scale oven trials confirmed the research work, pointing the way to full scale use.

Charging of 12 to 14 ovens per day permits use of flue dust at the average rate of production. The preferred carbonization blend is 80 pct of Eastern's Kopperston Eagle Seam coal (29.0-pct volatile matter) and 20 pct by weight of blast furnace flue dust, the latter being screened through  $\frac{3}{4}$  in. to remove tramp materials.

The concentration of flue dust can be varied from 10 to 30 pct without materially affecting the properties of the coke. The coking times used in the 18 $\frac{1}{4}$  in. ovens have been 21 and 23.5 hours.

**Brickwork Unaffected**—Carbonization of blends poses no particular problems. A year's operation has failed to disclose any indication of damage to brickwork.

Care is taken not to return any coke spillage back to an oven after pushing. The production of 1 ton of plus  $\frac{5}{8}$ -in. ferro coke requires 1.15 net tons of Kopperston coal. Whar-ton, Hernshaw Seam, 35.5-pct volatile matter coal and Beards Fork, Eagle Seam, 31.9-pct volatile matter coal have also been tested.

Physical properties of the ferro coke are excellent with good shatter and tumbler numbers. The coke is generally hard, heavy and resists degradation in handling. Compressive strength is notable in being extremely high.

Before use, breeze is screened out through a  $\frac{5}{8}$  inch screen. This breeze has been burned satisfactorily in boilers with conventional breeze up to concentration of about 15 pct.

**Easy Storage**—Ferro coke may be stored for long periods before use. In fresh coke most of the iron is in the free metallic form. After

several years, about one-half the iron is still metallic, the other half being present as oxides.

Reversion to oxides gives a rusty surface discoloration. On the other hand, physical strength is not impaired.

While ferro coke is a satisfactory blast furnace fuel, it's necessary to burden the furnace with full allowance for the metallic iron analysis. Otherwise, there need be no special precautions.

Eastern has experienced no difficulties when using ferro coke in a ratio of 2 parts ferro with 3 parts regular coke. This is the proportion that maintains a balance between ferro coke utilization and flue dust production.

The use of equal parts of both kinds of coke has been just as successful. In the six months since December 1957 some 47,000 tons of ferro coke have been consumed.

Total use has now approached 60,000 net tons.

**Note Savings** — Operating data have been gratifying. In addition to trouble-free experience, there has been a reduction in coke consumption. No purchased scrap was used in the furnace during this period of operation.

Mystic Iron Works has computed a saving of at least 41 lb of coke per gross ton of iron when operating with equal parts of ferro and regular coke. Also, an increase of 2 pct in the production of iron can be traced to the use of ferro coke.

Ferro coke has been made by others, particularly abroad. A wide range of ferrous materials has been used: fine ores, magnetite slimes, and miscellaneous concentrate. Much of this work has been experimental and long-term experience has rarely been reported.



**CUT SHOWS TEXTURE:** Clipper saw reveals ferro coke texture. Oxidation of iron does not impair physical strength.

# Fast Screw Machines Keep Close Tolerances

By D. A. Dettinger—Industrial Engineer, The DeVilbiss Co., Toledo.

**For screw-machine parts that demand accuracy and yet don't lend themselves to simplified design, fast production depends on machine setups.**

**Here is where automatic cycles can fit into complex machining steps.**

■ Getting close tolerances on high-production screw-machine parts calls for special care in setups and tooling. The DeVilbiss Co., a maker of spraying equipment, takes this approach on many of its machining operations.

On certain parts, machined from free-cutting brass rod, automatic single-spindle screw machines do fast work in holding to dimensional tolerances. Used in so-called "air caps", one part is a retaining ring, while a second, a part of several designs, mates with the ring.

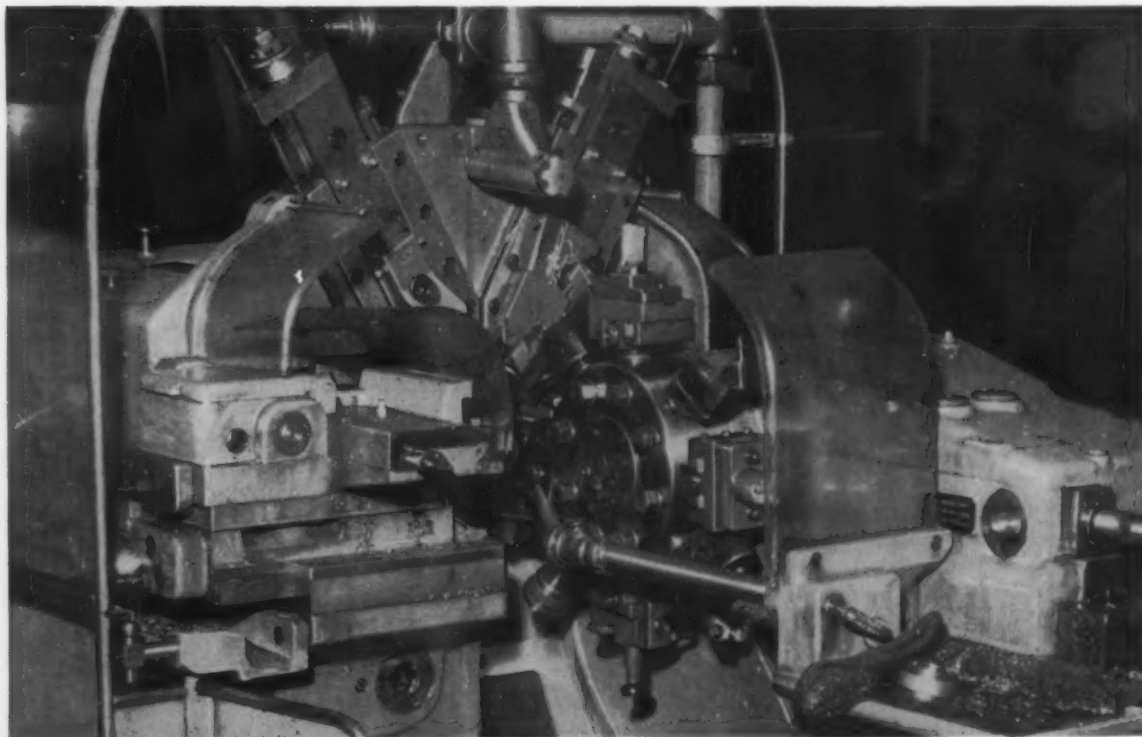
**No Room for Error**—The ring or sleeve, with an outside diameter of 1-9/16 in., has an inturned flange of 1 1/4-in. inside diameter at one end. At the other end, the 1 3/8-in.—24 internal thread is held to +0.001, -0.000 in. on pitch diameter.

Between the flange and the

thread, an undercut recess clears the single-point tool used to cut the thread. A deep-diamond knurl 3/8-in. wide and a part number are rolled on the outside diameter.

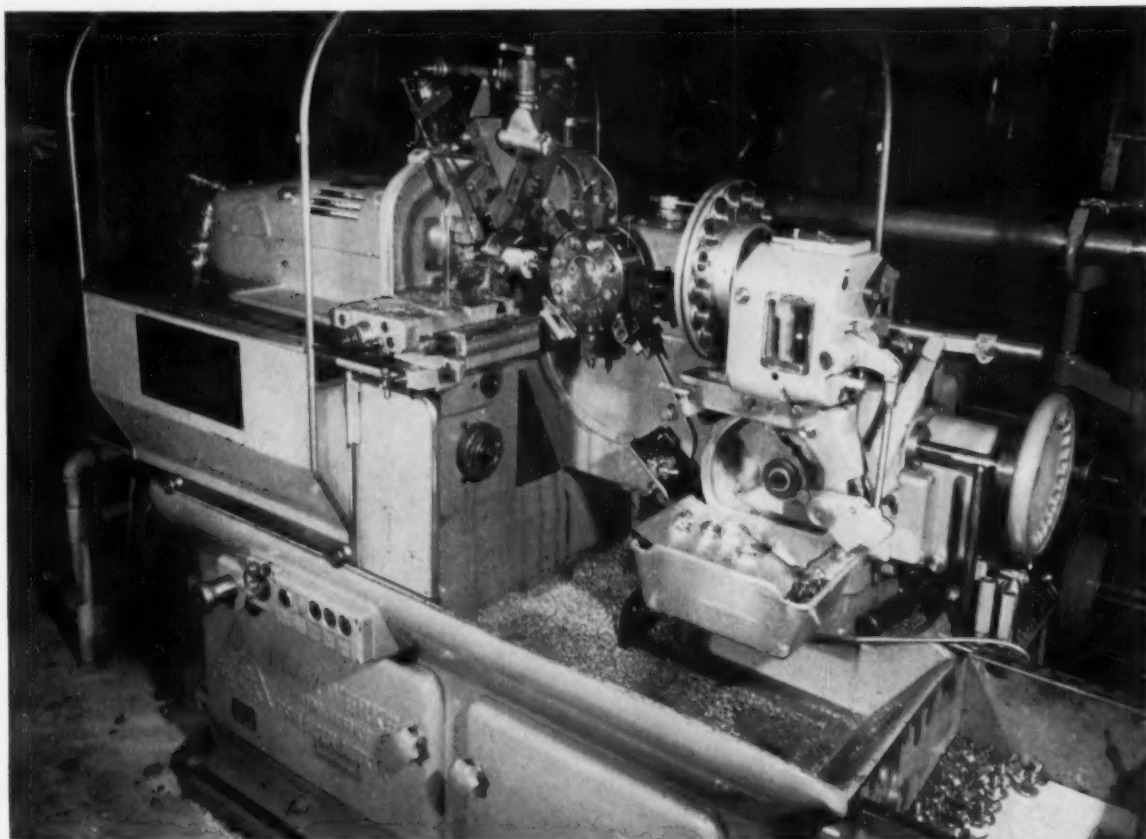
Mating with the rings, the second part, machined from 1-5/16-in. brass bar stock, has a flange that seats against the inner flange of the ring. Next to this is a pair of butterfly wings or arms whose outside diameter is turned for clearance through the flange hole of the ring.

Between the two wings is a tapered recess and a small boss with a 3/32-in. hole in the center. Next to the flange on its other side



**MULTIPLE STEPS:** Single-spindle unit turns out rings (sample at lower right). Single-point threading

tool mounted in attachment on the front cross-slide cuts the precise internal thread in seven passes.



**DIAL MAGAZINE:** Turret tool picks up winged parts from dial magazine and transfers them to chuck.

there is, in one design, a short boss with an undercut back of a narrow chamfer. In another design, the boss has a radial seat at its outer end.

**Cuts Internal Thread** — Production of the ring is conventional, save for cutting of the internal thread. Here a single-point high-speed steel tool cuts the thread in seven passes. A thread-chasing attachment mounted on the front cross-slide of the machine operates the tool.

In each pass, the tool first cross feeds radially outward to cut at specified depth. It's then advanced by a lead screw until the tool clears at the end of its cut.

Since the tool always follows the lead screw, the tool picks up the thread path of the prior cut with increased depth. The short cycles are repeated until the thread is completed.

For the mating parts, two single-spindle machines are used, one of which runs at 1500 rpm. With bar stock fed to length, the outside diameter is roughed. Then a tool similar to an end-mill, fed axially by the turret, produces the taper hole and near the end of its stroke machines the small boss at the center.

**Vertical Spindle Traverses** — Next a milling cutter, driven by a vertical spindle mounted on a transverse slide above the main spindle, feeds across. The cutter with radiused form produces the side faces of the wings and also removes a portion of the boss next to the large flange. After one cut, the main spindle turns 180° and the cut is repeated to form the other side of the wings.

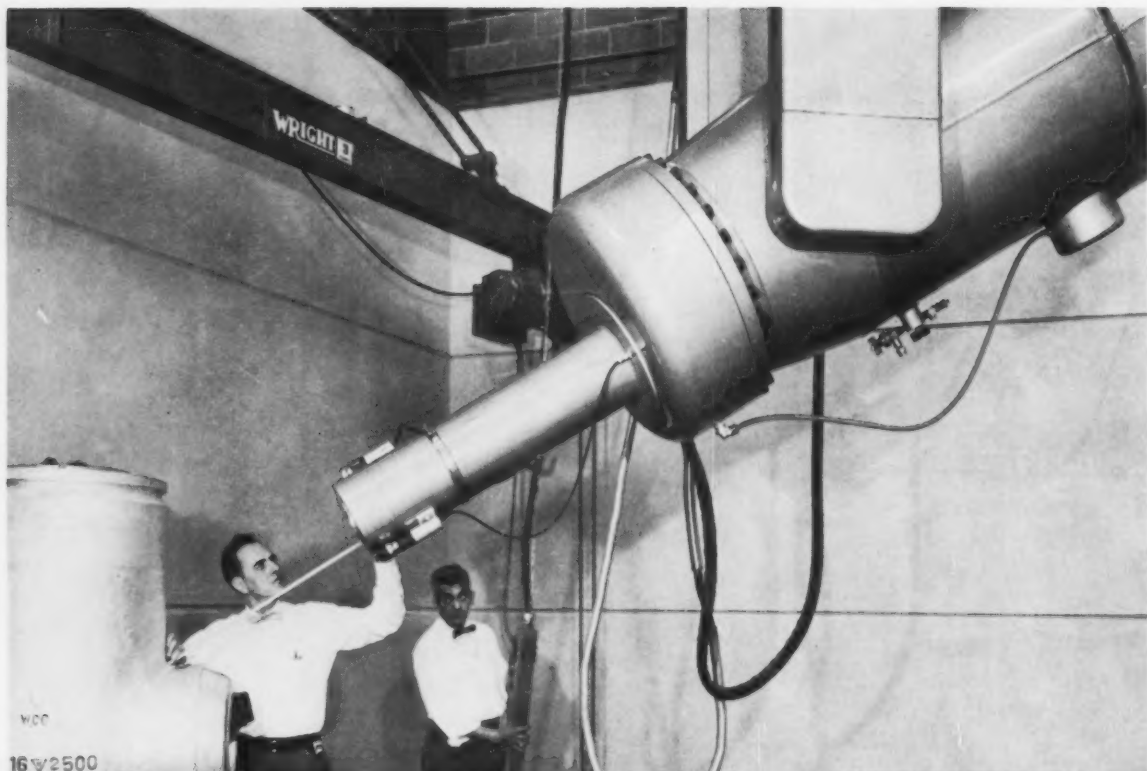
After final forming of the outside diameter, the piece, cut off from the bar, falls into a chute. It

takes 70 seconds for the cycle.

Mating parts of a second type require other operations and are shifted to another single-spindle unit. The parts are loaded into 20 mating holes of an indexing dial magazine on a turret. Even while loading the fixture, the operator does not interfere with continuous operation of the machine.

**Automated Chucking** — A turret tool picks a piece from the dial and turns it 180° for insertion into a chuck. The wings of the part fit into recesses of the chuck, which automatically centers and grips the work piece.

A turret tool roughs a hole including its tapered portion and its steps. A single-point tool in the turret produces a male radial seat. The front cross slide moves to actuate the cross feed of this tool. The completed piece is then released and it falls into a chute.



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## Cuts Radiography Bottlenecks

**More and more, customers are calling for radiographic inspection. Here's how one firm achieved higher output.**

■ What's said to be metalworking's most up-to-date radiographic lab was unveiled in Reading, Pa., last week by American Chain & Cable Co., Inc.

Built to serve ACCO's Steel Casting and R-P&C Valve divisions, the new lab sets the pattern for eliminating one of the industry's fastest growing bottlenecks. Valve and castings buyers—especially in the power and processes fields—are demanding new standards of quality. With high operating temperatures and pressures becoming the rule, low-voltage x-ray units and low-

energy gamma-ray sources are no longer able to keep pace with production.

Heart of the ACCO setup is a 2-million electron-volt Van de Graaff x-ray generator made by High Voltage Engineering Corp., Burlington, Mass. To quickly position the huge machine, American Chain's Wright Hoist Div. came up with a modified 7½-ton bridge crane designed for fast, precise combinations of vertical and horizontal travel. Together with the generator's high output, it permits getting the tube extension inside a casting and penetrating 8 in. of steel in just 15 minutes.

**Also Use Gamma Rays**—Supplementing the x-ray unit at ACCO's laboratory is a more powerful gam-

ma-ray emitter. The new 10-Curie source of Cobalt 60, used mostly for miscellaneous thinner-walled castings, can radiograph 6 in. of steel in 2 hours, at an 18-in. focal distance.

The whole works, including a new darkroom and film-viewing room, is housed in a special building designed expressly for the purpose. Walls of the x-ray room are 4 ft of high-density concrete; those of the gamma-ray chamber measure 2 ft. thick.

All told, the new lab will be able to expose and process 140 films per day—a nine-fold increase over the firm's former facilities. In terms of castings, it can handle about 5760 units a year, or 8 times more than before.



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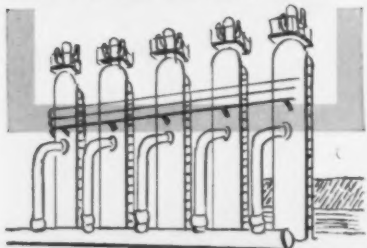
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Construction details on a line of solenoid operated valves are blueprinted in a compact bulletin. Other topics covered include service information, suggested uses, operating pressures, and instructions for ordering. (Golden Anderson Valve Specialty Co.)

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Complete specifications for a six-spindle drill with a power indexing turret are available in an illustrated brochure. Spindle speeds and depth control are both pre-selective. (Burg Tool Mfg. Co., Inc.)

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A data sheet lists the features of a new multi-purpose barrel finishing unit. It's designed for the shop that finds it impossible to install separate machines for each individual job. (Speed-D-Burr Corp.)

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Disposing of spent pickle liquor by a neutralizing process is dis-

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Various chemicals, salts, acids, liquid wastes, as well as water can be heated with submerged combustion. It's discussed in a new bulletin including schematic diagrams of basic heating and control systems. (Thermal Research & Engineering Corp.)

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Bronze and iron body check valves are covered in a new brochure with over 40 illustrations. (The Fairbanks Co.)

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Entitled "Bank Book for Savings in Cold Heading" and actually the size of a bank book, a new publication covers many hints on how cold heading can solve many metalworking problems. (Progressive Mfg. Co., Div. of The Torrington Co.)

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*No order too large or too small!*

*The* **U. S. STEEL WIRE SPRING Co.**

7800 FINNEY AVE. • MICHIGAN 1-6315

CLEVELAND 5, OHIO



## FREE LITERATURE

alloys. Catalog covers performance information and prices. (Brown & Sharpe Mfg. Co.)

For free copy circle No. 15 on postcard, p. 109

### Training Program

A four-page folder outlines the course of study of a free training program in visual communication techniques. It's a course designed to give first-hand experience in use of visual communication tools. (Technifax Corp.)

For free copy circle No. 16 on postcard, p. 109

### Solution Filters

"A New Concept of Electroplating Filtration" is the title of a booklet. It explains how a filter with honeycomb filter tubes provides tank turnover up to 3 times per hour. (Commercial Filters Corp.)

For free copy circle No. 17 on postcard, p. 109

### High Strength Castings

Describing forging materials available for aircraft and missile structural parts, a 16-page booklet classifies them for various speed and temperature ranges. (The Steel Improvement & Forge Co.)

For free copy circle No. 18 on postcard, p. 109

### Temperature Control

Facts about temperature programming in gas and vapor chromatography are covered in an eight-page bulletin. (Burrell Corp.)

For free copy circle No. 19 on postcard, p. 109

### Ductile Iron

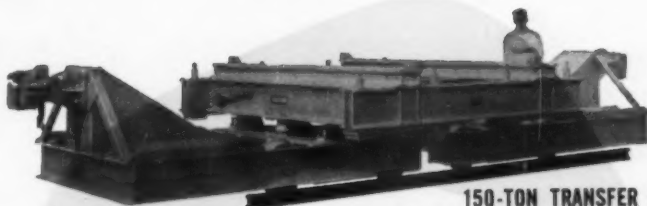
A six-page folder tells you how to make the most of ductile iron. (The Hamilton Foundry & Machine Co.)

For free copy circle No. 20 on postcard, p. 109

### Motor Service

For warranty service on a line of electric motors, gear shift drives and speed reducers, a bulletin lists more than 200 service stations. (The Lima Electric Motor Co., Inc.)

For free copy circle No. 21 on postcard, p. 109



**150-TON TRANSFER CAR**  
double-truck design, automatic couplers.

## TRANSFER CARS

**CUSTOM-BUILT** and quality-built to suit requirements. For locomotive haul or self-propelled. Engineering counsel is provided to assist in the design and application of EASTON custom-built cars for all types of service.



**150-TON TRANSFER CAR**  
designed to negotiate a 300' radius curve.



Write or telephone for technical information.



### Bucyrus-Erie Co. installs ARCAIR—saves time in Clean-up of Castings

Bucyrus-Erie Co. has installed Arcair for foundry cleaning room operations at its Erie (Pa.) Works.

With three conditioning booths equipped with Arcair torches, considerable time is being saved in casting clean-up—removal of riser stubs, flash, inclusions and defects. And operators learned the process easily and quickly.

You too can save with Arcair! Basic simplicity—electric arc plus ordinary compressed air—makes Arcair the new, efficient, cost-cutting answer to your metal removing problems.

Send today for full information!



**Metal Removal Torches**

443 S. Mt. Pleasant St., Lancaster, Ohio

# PROPOSALS SOLICITED FOR LEASE OF DEPARTMENT OF THE ARMY INDUSTRIAL FACILITIES



**All or portions of the above installations are available for use for commercial purposes. Possible uses are unlimited.**

**Facilities:** Oleum plants (sulphuric acid); nitric acid; acid concentration; ether still; nitrocellulose; various explosive manufacturing; organic chemical manufacturing; steel foundries; heavy and light manufacturing; loading and assembling; offices; warehouses; power plants; storage tanks; many other facilities.

**Transportation:** Rail and highway facilities are available to these installations, including intra-plant rail and road systems.

**Utilities:** All necessary utilities are available.

**Labor:** There is a surplus of both skilled and unskilled labor in the immediate vicinity of most plants.

Detailed information, arrangements for inspections, invitations for proposals and sample form of lease may be obtained from the U. S. Army Division Engineer having jurisdiction over the area in which you are interested. The addresses of the Divisions Engineers are:

**MISSOURI RIVER**  
PO Box 1216  
Omaha, Nebr.

**SOUTH ATLANTIC**  
PO Box 1889  
Atlanta, Georgia

**OHIO RIVER**  
PO Box 1159  
Cincinnati, Ohio

**NORTH CENTRAL**  
536 So. Clark St.  
Chicago 5, Ill.

**NORTH ATLANTIC**  
90 Church St.  
New York 7, N. Y.

**SOUTH PACIFIC**  
PO Box 3339  
Rincon Annex  
San Francisco, Calif.

**SOUTHWESTERN:** 1114 Commerce St., Dallas, Texas

## MISSOURI RIVER

1. Cornhusker Ordnance Plant, Grand Island, Nebr.
2. Iowa Ordnance Plant, Burlington, Iowa
3. Kansas Ordnance Plant, Parsons, Kansas
4. Lake City Arsenal, Independence, Mo.
5. Nebraska Ordnance Plant, Wahoo, Nebr.
6. Rocky Mountain Arsenal, Denver, Col.
7. St. Louis Ordnance Plant, St. Louis, Mo.
8. St. Louis Ordnance Steel Foundry, St. Louis, Mo.
9. Sunflower Ordnance Works, Lawrence, Kansas

## NORTH ATLANTIC

1. Birdsboro Ordnance Steel Foundry, Birdsboro, Pa.
2. Burlington Ordnance Plant, Burlington, N. J.
3. Edgewood Arsenal, Edgewood, Md.
4. Ordnance Assembly Plant, Edgewood, Md.
5. Radford Arsenal, Radford, Va.

## NORTH CENTRAL

1. Badger Ordnance Works, Baraboo, Wisc.
2. East Chicago Ordnance Steel Fdy., East Chicago, Ind.
3. Joliet Arsenal, Joliet, Ill.
4. Kingsbury Ordnance Plant, La Porte, Ind.
5. Twin Cities Arsenal, New Brighton, Minn.
6. Wabash River Ordnance Works, Newport, Ind.

## OHIO RIVER

1. Coraopolis Ordnance Steel Foundry, Coraopolis, Pa.
2. Indiana Arsenal, Charlestown, Ind.
3. Jefferson Proving Ground, Madison, Ind.
4. Lima Ordnance Steel Foundry, Lima, Ohio
5. Marshall Plant, New Martinsville, W. Va.
6. Ravenna Arsenal, Apco, Ohio
7. Ridgewood Ordnance Plant, Cincinnati, Ohio

## SOUTH ATLANTIC

1. Alabama Ordnance Works, Childersburg, Ala.
2. Holston Ordnance Works, Kingsport, Tenn.
3. Milan Arsenal, Milan, Tenn.
4. Phosphate Development Works, Sheffield, Ala.
5. Volunteer Ordnance Works, Tyner, Tenn.

## SOUTH PACIFIC

1. Pacific Ordnance Steel Foundry, Pittsburg, Calif.
2. Riverbank Ordnance Plant, Riverbank, Calif.

## SOUTHWESTERN

1. Lone Star Ordnance Plant, Texarkana, Texas
2. Longhorn Ordnance Works, Karnack, Texas
3. Louisiana Ordnance Plant, Shreveport, La.
4. Oklahoma Ordnance Works, Pryor, Okla.
5. Pantex Ordnance Plant, Amarillo, Texas

# CORPS OF ENGINEERS, U.S. ARMY



Power-Up with new  
Westinghouse **Life-Line H**  
d-c motors



**Greater protection . . . maximum  
reliability . . . longer, trouble-free life**

**HERE'S WHY:** The rugged new Westinghouse Life-Line® "H" d-c motor gives you the most complete and advanced protection available in dripproof industrial d-c machines. Elimination of uncovered side openings . . . use of heavy, cast end brackets . . . effective seals throughout . . . all combine to provide outstanding resistance to liquids, vapors and dirt. For these reasons you can count on the Life-Line "H" to give you greater reliability with a minimum amount of maintenance under *all* operating conditions.

Plus . . . these other important advantages .....

YOU CAN BE SURE...IF IT'S **Westinghouse**

## These exclusive features of the new Westinghouse *Life-Line* **H** d-c motor guarantee top performance . . . longer, trouble-free life

### TEN TIMES LONGER INSULATION LIFE . . .

New silicone insulation in Westinghouse Life-Line "H" d-c motors and generators stands up under temperatures which turn ordinary insulation to a cinder. High-temperature silicone insulation is used with the full complement of iron and copper required for low Class B temperature. Result: Life-Line "H" shrugs off emergency overloads and abnormal ambients to keep production rolling, maintenance down.

**CLEANER, COOLER OPERATION** results from new controlled ventilation system of Life-Line "H." Ordinary d-c motors draw air in at commutator end, contaminate windings by drawing carbon dust from commutator brush wear *into* the machine. Life-Line "H" reverses this flow. Air and carbon dust are expelled at commutator end . . . assuring cleaner, cooler windings . . . longer motor life . . . less maintenance.



**FASTEST RESPONSE** . . . 35 per cent increase in commutating ability . . . up to 55 per cent lower mechanical inertia . . . and up to 30 per cent reduction in electrical inertia mean that the new Westinghouse Life-Line "H" d-c motor provides the fastest acceleration, quickest reversing and closest speed regulation. This means more production, better product quality, minimum complexity of control.

**SIMPLIFIED MAINTENANCE** . . . With the new Life-Line "H," maintenance is not only substantially reduced but periodic inspections are also greatly simplified. For example: as shown above, Uniforce brushholder fingers lock out . . . brushes can be inspected or changed with one hand. And Uniforce tension remains constant throughout brush life . . . no need to adjust pressure as brushes wear.

For information about the ways you can profitably put the new Life-Line "H" motor to work, contact your nearby Westinghouse representative. Or, write

Westinghouse Electric Corporation, P. O. Box 868,  
3 Gateway Center, Pittsburgh 30, Pa.

J1-22121

**YOU CAN BE SURE...IF IT'S Westinghouse**



## FREE LITERATURE

Continued

These publications describe money-saving equipment and services . . . they are free with no obligation . . . just circle the number and mail the postcard.

### Conveyor Furnaces

Featuring variable speed electronic drive, automatic temperature controls, sinuous wound ribbon-type heating elements, a series of conveyor furnaces is covered in a new bulletin. (C. I. Hayes, Inc.)

For free copy circle No. 25 on postcard

### Plastic Tooling

Various materials, products, and equipment used in plastic tooling methods are described in a series of five new technical bulletins. (Houghton Laboratories, Inc.)

For free copy circle No. 26 on postcard

### Transformers

Production facilities and the types of transformers built for every class of service are pictured and described in a four-page brochure. (Eisler Transformer Co., Inc.)

For free copy circle No. 27 on postcard

### Tube Conveyor

A totally enclosed conveyor for handling bulk materials features a two-direction chain. A booklet describes its application for such uses as removal of chips and scrap materials from any number of machine tools. (Prab Conveyors, Inc.)

For free copy circle No. 28 on postcard

### Pallet Containers

Specifications, capacities, base plans and side or end gate details for a broad range of steel pallet containers are detailed in an 18-page catalog. (Union Steel Products Co.)

For free copy circle No. 29 on postcard

## Classifying Systems

A new bulletin explains the operating characteristics of both centrifugal and gravitational type classifiers. These production units include no moving parts. (Buell Engineering Co., Inc.)

For free copy circle No. 30 on postcard

## Lift Trucks

Handling long loads in limited aisle space is a problem solved by the case-history technique in this illustrated brochure. (Hyster Co.)

For free copy circle No. 31 on postcard

## Handling on Pallets

Here's information on how to use your industrial trucks in a palletization program. It's applicable to any company plagued with high volume handling of semi-finished components and completed accessories. (The Elwell-Parker Electric Co.)

For free copy circle No. 32 on postcard

## Conveyor Idlers

Eight pages detail the development of an idler from laboratory to installation. Grease retaining seals are treated in numerous drawings and photographs. (The Jeffrey Mfg. Co.)

For free copy circle No. 33 on postcard

## High Voltage Switch

A data sheet gives performance details and environmental conditions of a hermetically sealed high voltage rotary selector switch. The switch is for remote control applications. (G. H. Leland, Inc.)

For free copy circle No. 34 on postcard

## Palletless Handling

Action photos illustrate a bulletin showing how a customer applied the principle of palletless handling to moving and storing cartons of dishwashers. (Lewis-Shepard Products, Inc.)

For free copy circle No. 35 on postcard

## Aluminum Wire

Specifications, engineering data, and availabilities of flattened alu-

Postcard valid 8 weeks only. After that use own letterhead fully describing item wanted. 9/25/58

Circle numbers for Free Technical Literature or Information on New Equipment:

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31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
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FIRST CLASS  
PERMIT No. 36  
New York, N. Y.

BUSINESS REPLY CARD  
No postage necessary if mailed in the United States

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Post Office Box 77  
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## FREE LITERATURE

minum wire are presented in a six-page technical reference folder. (Kaiser Aluminum & Chemical Sales, Inc.)

For free copy circle No. 36 on postcard

## Steel Products

A booklet illustrates the many steps involved in producing custom-made steel products. It covers melting, forging, heat treating, machining, testing, and inspection. (Midvale-Heppenstall Co.)

For free copy circle No. 37 on postcard

## Conveyors

An effective guide for selecting the right conveyors for any job covers a line of power belt and gravity conveyors. (A. B. Farquhar Div., The Oliver Corp.)

For free copy circle No. 38 on postcard

## Cupola Equipment

A four-page folder describes a firm's line of hot-blast cupola equipment that results in substantial coke savings. (The Brown Thermal Development Co.)

For free copy circle No. 39 on postcard

## Heat Treat Furnaces

Fifty-seven standard models of electric heat treating furnaces are covered in a 12-page catalog. Controls, instruments, elements and accessories are listed. (Lucifer Furnaces, Inc.)

For free copy circle No. 40 on postcard

## Welding Equipment

A folder describes all types of automatic and semi-automatic welding equipment covering power sources, wire feed mechanisms, guns, heads and controls for submerged arc and inert-gas shielded arc welding. (Hobart Brothers Co.)

For free copy circle No. 41 on postcard

## Ball Bearings

A catalog folder shows how dual-labyrinth seals insure long bearing life and provide lasting protection

for a line of cartridge ball bearings. (Hoover Ball and Bearing Co.)

For free copy circle No. 42 on postcard

## Hard-Surfacing

A data sheet describes the content, properties and typical uses for a new tungsten carbide powder which serves as a hard-surfacing material. (Wall Colmonoy Corp.)

For free copy circle No. 43 on postcard

## Steel Pillow Blocks

Design and dimension data are shown in a new eight-page catalog describing a line of cast steel pillow blocks for rolling mill table applications. (SKF Industries, Inc.)

For free copy circle No. 44 on postcard

## Magnet Wire Coating

Information on the properties of a modified silicone magnet wire coating is contained in a new four-page brochure. (Dow Corning Corp.)

For free copy circle No. 45 on postcard

## Pumps, Fluid Motors

A complete line of pumps, fluid motors and valves are covered in a new 12-page catalog. Internal gear pumps, sliding vane pumps, spur external gear pumps and fluid motors are described in detail. (Tut-hill Pump Co.)

For free copy circle No. 46 on postcard

## Steel Marketing

A new booklet puts the accent on service and specialty grades of electric furnace carbon, alloy and stainless steels. (A. M. Byers Co.)

For free copy circle No. 47 on postcard

## Systems Handbook

An elaborate 15-section handbook describes "building block" components which can be fitted together to do virtually any job a manufacturer might require. With them it's claimed you can supply a plant with power, build a machine, even collect and record facts. (Alden Systems Co.)

For free copy circle No. 48 on postcard



## *Memo to a Man of "Parts"*

The number of different parts made from Roebling High Carbon Specialties, Flat Wire and Spring Steel are close to countless.

Some things you can count on, though, are the consistent dimensional and mechanical uniformity you get with any Roebling High Carbon Specialty. They are the qualities that contribute to speeding *your* production and cutting *your* costs.

They are high qualities that make for high values. Next time you need flat wire or spring steel, specify Roebling. Write Wire and Cold Rolled Steel Products Division, John A. Roebling's Sons Corporation, Trenton 2, New Jersey.

**ROEBLING**



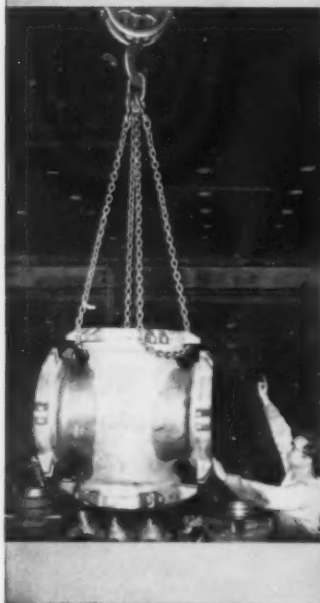
Branch Offices in Principal Cities  
Subsidiary of The Colorado Fuel and Iron Corporation

*Roebling... Your Product is Better for it*

**ACCO**  
for Better  
Values

## Acco Registered® Slings—Chain and Cable

▼ CHAIN



COMBINATION



▼ WIRE CABLE



## ACCO—your first source for any sling for any job

Whatever your sling requirements, there's an ACCO Registered Sling to do your particular lifting job in the safest, most economical way possible. Your rigger knows why certain slings should be used to lift certain types of loads, depending on varying factors of shape, weight, material and finish. Sometimes chain slings are necessary; other times cable; and on certain lifts a combination of chain and cable slings are best.

Because sling work requirements do vary from job to job, make certain that all your slings are precision-made under uniform conditions of quality control and pre-tested before they leave the factory. Only ACCO Registered Slings can give you this assurance...in the widest range of sizes and styles from any single source.

In addition, you get the latest technical improvements in ACCO

Registered Slings. For example, there's the new shaped Master Link now available without extra charge on all ACCO Registered Slings. This new link, an exclusive development of ACCO engineers, gives 18% greater resistance to distortion with no increase in weight. Just one more quality bonus you get from ACCO Registered Slings.

Each of these slings is factory proof-tested at a load of no less than twice its rated capacity. Only after a sling has passed this rigorous test is it given the ACCO tag and certificate of registration.

Tell your distributor you prefer ACCO Registered Slings.

### WHAT "ACCO REGISTERED" MEANS

- 1 The best material
- 2 Unit safety factor (on bodies, rings, links, hooks)
- 3 Proof test of complete sling to twice the working load limit
- 4 Actual field service test of each design
- 5 Metal identification ring or tag on each sling
- 6 Signed Registry Certificate with each sling

### AMERICAN CHAIN & CABLE BRIDGEPORT, CONN.

Atlanta, Boston, Chicago, Denver, Detroit, Houston, Los Angeles,  
New York, Odessa, Tex., Philadelphia, Pittsburgh, Portland, Ore.,  
San Francisco, Wilkes-Barre, Pa., York, Pa.  
In Canada: Dominion Chain Co., Ltd., Niagara Falls, Ont.

**ACCO**

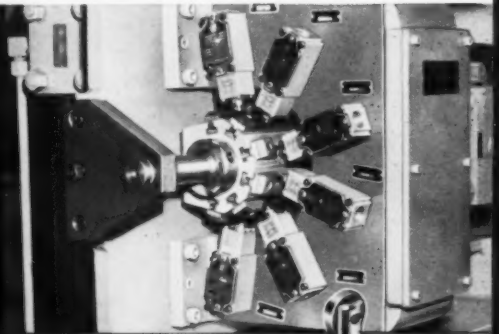




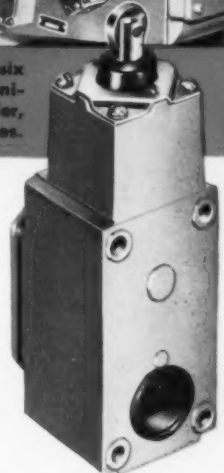
# ALLEN-BRADLEY

# BULLETIN 802T

# OILTIGHT LIMIT SWITCHES



Radial mounting of six Allen-Bradley "manifold" type, push roller, oiltight limit switches.



Push roller, oiltight limit switch, showing rubber grommeted wiring hole on back of "manifold" type, used on above automatic production machine made by Cross Company, Detroit.



SIDE  
PUSH ROD



FORK LEVER  
TYPE



ADJUSTABLE  
ROD

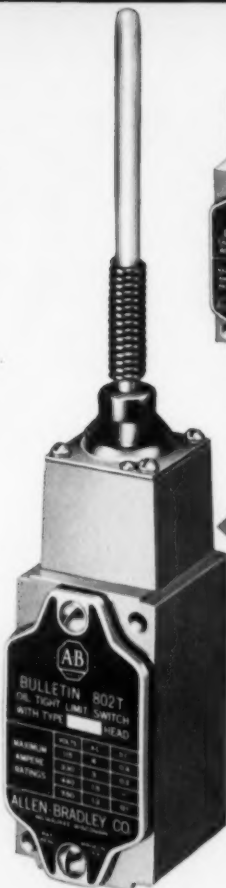


TOP PUSH ROD  
WITH PLASTIC  
WINDOW

← **OIL SEALED HEAD  
AND BODY**

**assure reliable operation**

Completely sealed . . . oil, dirt, and metal chips cannot foul up contacts or operating mechanism. Operating heads are interchangeable—can be mounted in any one of four positions. New "wobble stick" heads operate in any direction. All of these limit switches have maintenance free, double break, silver alloy contacts. Specify Allen-Bradley—the quality line of limit switches.



WOBBLE  
STICK TYPE



ROLLER LEVER  
FOR CAVITY  
MOUNTING



ADJUSTABLE  
ROLLER  
LEVER



# ALLEN-BRADLEY

## MOTOR CONTROL

Allen-Bradley Co., 1316 S. Second St., Milwaukee 4, Wis.  
In Canada: Allen-Bradley Canada Ltd., Galt, Ont.

QUALITY

9-33-0



# THE ONLY LINE OF

## D. C. MOTOR STARTERS *with modern* SOLENOID CONTACTORS

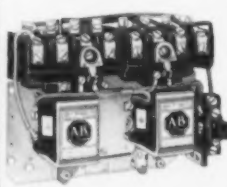
With Allen-Bradley, you get D. C. motor control that is *completely modern!* It uses the simplest switching mechanism yet conceived . . . the solenoid contactor with only **ONE** moving part. There are no bearings to stick . . . no jumpers to break. This assures millions of trouble free operations. And the double break, silver alloy contacts never need maintenance. Available in ratings up through Size 4. Write for details.

### CONTACTORS



Bulletin 202 solenoid type contactor. In ratings to 150 amp. Also, clapper type to 600 amperes.

### FULL VOLTAGE STARTERS

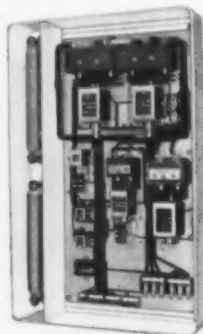
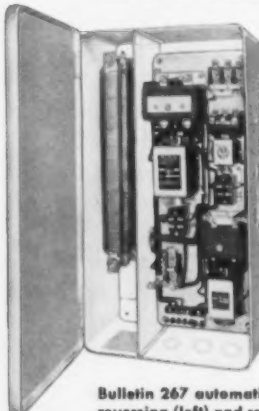


Bulletin 205 full voltage reversing starter. Ratings to 1½ hp, 115 v; 2 hp, 230 v.



Bulletin 209 full voltage starter. Available in ratings up to 1½ hp, 115 v; 2 hp, 230 v.

### REDUCED VOLTAGE STARTERS



Bulletin 267 automatic time limit resistor type starters. Non-reversing (left) and reversing (right). Solenoid type to 20 hp, 115 v; 40 hp, 230 v. Clapper to 75 hp, 115 v; 150 hp, 230 v.

9-58-MB

**ALLEN-BRADLEY**  
MOTOR CONTROL  
QUALITY

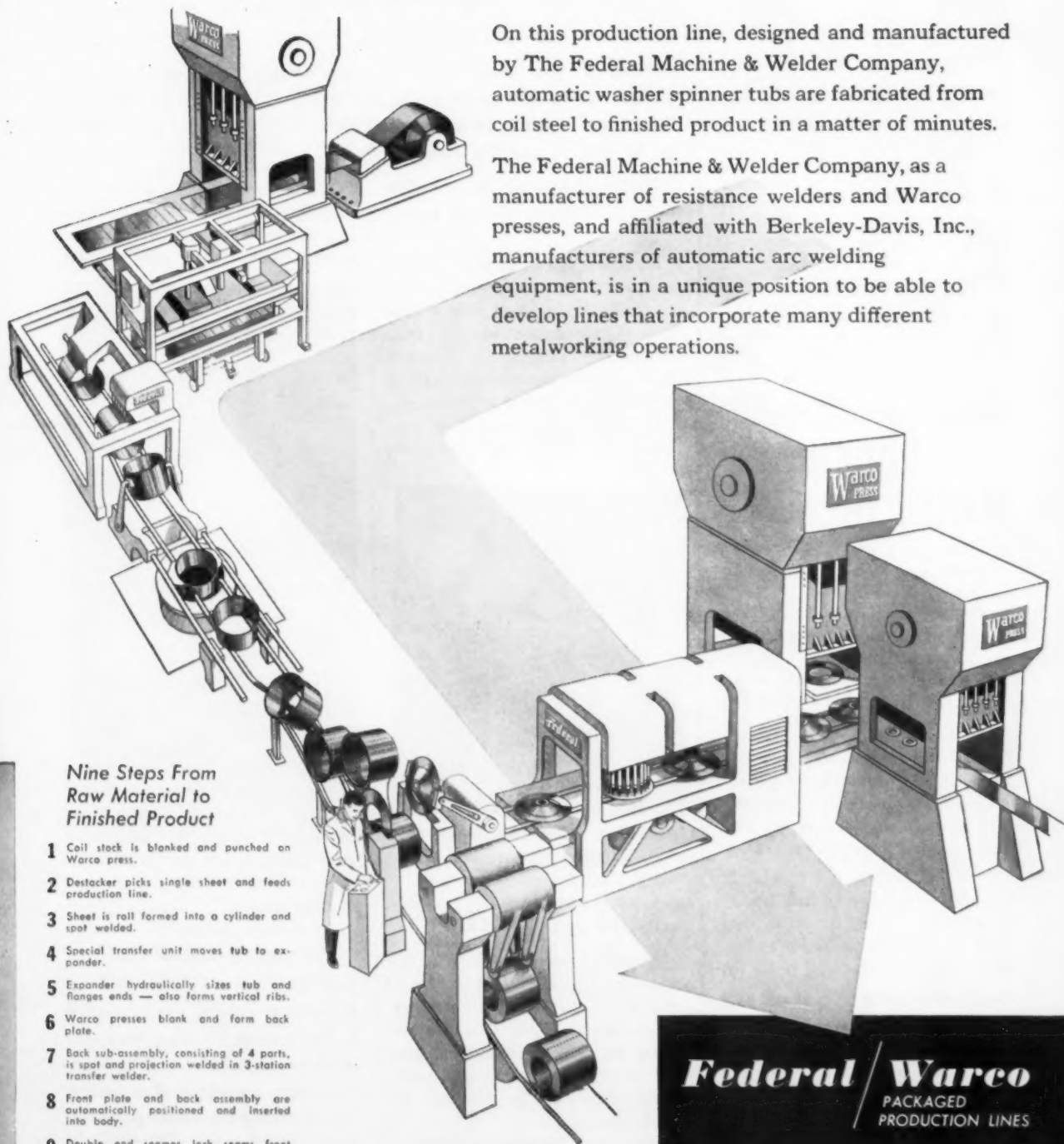
**MAIN OFFICE  
and Factory**  
1316 S. Second St.  
Milwaukee 4, Wis.

In Canada: Allen-Bradley  
Canada Ltd., Galt, Ontario

# THE ACCENT IS ON PRODUCTION in a production line by **FEDERAL**

On this production line, designed and manufactured by The Federal Machine & Welder Company, automatic washer spinner tubs are fabricated from coil steel to finished product in a matter of minutes.

The Federal Machine & Welder Company, as a manufacturer of resistance welders and Warco presses, and affiliated with Berkeley-Davis, Inc., manufacturers of automatic arc welding equipment, is in a unique position to be able to develop lines that incorporate many different metalworking operations.



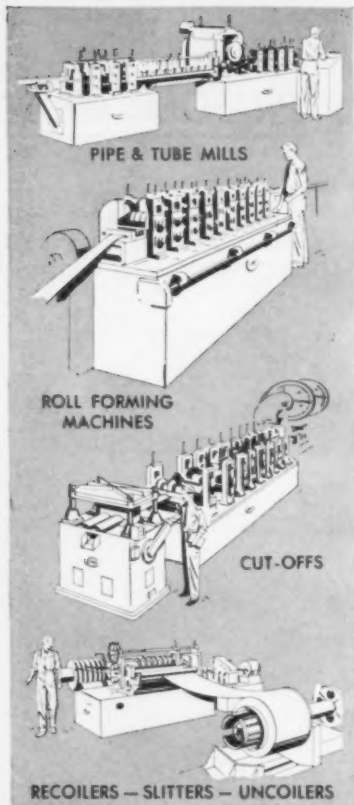
## Nine Steps From Raw Material to Finished Product

- 1 Coil stock is blanked and punched on Warco press.
- 2 Destacker picks single sheet and feeds production line.
- 3 Sheet is roll formed into a cylinder and spot welded.
- 4 Special transfer unit moves tub to expander.
- 5 Expander hydraulically sizes tub and flanges ends — also forms vertical ribs.
- 6 Warco presses blank and form back plate.
- 7 Back sub-assembly, consisting of 4 parts, is spot and projection welded in 3-station transfer welder.
- 8 Front plate and back assembly are automatically positioned and inserted into body.
- 9 Double end seamer lock seams front plate and back assembly to body and ejects finished tub.

\* Sequence of operations controlled by static relay system designed and built by Federal.

**Federal / Warco**  
PACKAGED  
PRODUCTION LINES

**THE FEDERAL MACHINE AND WELDER COMPANY, WARREN, OHIO**  
Affiliated with Berkeley-Davis, Inc., Danville, Illinois



## YODER MAKES THEM ALL

*...Complete equipment lines  
for heavy or light production!*

Uncoilers, slitters, roll-forming machines, cut-offs, pipe and tube mills, special machinery for ferrous or non-ferrous metals are all made and engineered by Yoder to fit your specific requirements.

Special attachments and auxiliary units can perform additional operations such as welding, coiling, punching or embossing without extra labor cost while increasing production speed.

Let Yoder engineering and "know-how" help you get the most from your plant... with Yoder equipment. For full details, write to:

**THE YODER COMPANY**  
5510 Walworth Ave. • Cleveland 2, Ohio



Visit Booth 2770, Metal Show,  
Cleveland, Ohio, October 27-31.

### TECHNICAL BRIEFS

# Torch Cleans Cast Parts Quickly

**When a job shop finds a method works on small parts, it's a good bet the larger sizes are in line to get the benefits.**

**That's the way it is with foundry cleaning at one plant.**

■ Review of methods with a stress on cost reduction and control is a critical factor in a job shop operation. Quite aware of this fact, Atlantic Steel Castings Co., Chester, Pa., is constantly reviewing methods and its own ideas for improvement.

Cleaning room practices in particular have come under study. It's

considerably. Nine men now can clean 32-pct more tonnage than 15 men could handle over a given period. This was despite a more rigid inspection schedule.

With success on the smaller size castings, the firm decided to invest in a new 900-amp machine designed to burn larger carbon rods and make



**Torch burns away excess metal from a casting.**



**Inspector using Magnaflex unit check casting for defects.**

here that the success of torch cleaning became quickly evident.

**Immediate Results**—The firm decided to try a carbon-air torch method on its small and medium size castings. Going from fin removal to defect removal, to pad and head removal, the shop personnel were able to eliminate all rough chipping.

Man hours for cleaning dropped

possible steadier contacts for longer periods. The unit was built by Hobart Brothers Co., Troy, O.

**Try the Large Size**—Having used ½-in. rod on the former equipment, the firm tried ¾-in. copper coated rod on the new unit. The results were gratifying on the larger units and fin and defect removal were speeded 30 pct.

### Want More Data?

You may secure additional information on any item briefed in this section by using the reply card on page 109. Just indicate the page on which it appears. Be sure to note exactly the information wanted.



Later the firm installed a new 1200-amp Hobart unit using  $\frac{3}{4}$ -in. rod. It's resulted in elimination of rough chipping on all castings regardless of size.

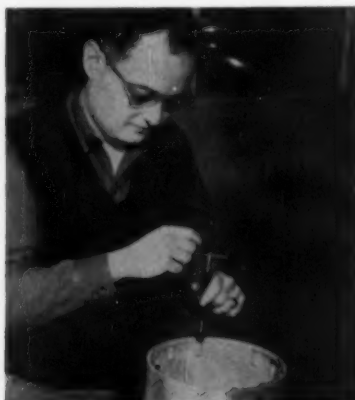
## Fabricating

### Wire thread inserts salvage large aluminum castings

When 40 cylindrical aluminum castings arrived incorrectly heat-treated, the threads tapped at each end either stripped or chipped off. At this stage the casting represented \$2000 in material and labor.

Facing this situation, the firm, Franklin Machine Products Co., West Trenton, N. J., used \$50 worth of stainless steel wire thread inserts to salvage all the castings. The inserts and inserting tool are products of Heli-Coil Corp., Danbury Conn.

**Back to Size**—The damaged threads were drilled out and new threads were tapped on a drill press to accommodate the inserts. Not only were the castings reclaimed, but the threads provided by the in-



**Worker places a wire thread insert in the cast cylinder.**

serts were 25 pct stronger than unprotected threads in properly heat-treated aluminum.

The complete assembly of which the cylinder is a part is made up of several other aluminum castings. The inserts come in handy for repairing other threads occasionally stripped or damaged in the process of assembly.



**Don't throw away  
those epoxy-coated  
rejects**

## Here's a new paint stripper that will save them

Do you scrap perfect metal parts that have been imperfectly coated with epoxies, vinyls, polyesters and other hard-to-strip paints or lacquers?

In the last few months, users of Oakite Stripper S-A have eliminated many such losses. Here's what some of them say about it:

**CALIFORNIA:** An aircraft manufacturer tested many strippers on an epoxy designed to resist attack by hydraulic fluid. Finally found that Oakite Stripper S-A is "the only one that safely strips this paint from anodized aluminum."

**NEW YORK:** A camera maker coats flash bulb reflectors with black vinyl paint outside and aluminum paint inside. "Stripper S-A is the fastest ever used on our rejects."

**OHIO:** A maker of toy pistols had trouble stripping alternate coats of lacquer and metallized aluminum. Now "Stripper S-A does it amazingly fast and remetalizing is completely satisfactory."

**CALIFORNIA:** A producer of metal furniture uses Stripper S-A to remove clear epoxy from plated parts. Chemist says "This is the best stripper on the market."

**ALABAMA:** A hardware maker had trouble stripping lacquer from brass door knobs. Oakite Stripper S-A now does the work in "less than  $\frac{1}{2}$  the time taken by any other stripper."

**NEW YORK:** A manufacturer of business machines tested several strippers on various finishes on steel and aluminum. Verdict in favor of Stripper S-A was: "It's doing a wonderful job."

**CONNECTICUT:** A maker of brass lipstick shells has found that "Stripper S-A quickly strips epoxy lacquers from rejects and heavily coated work spindles."

**CALIFORNIA:** A missile maker reports that "Stripper S-A is doing a fine job stripping vinyl from stainless steel and titanium."

**FREE** Write Oakite Products, Inc.,  
30H Rector St., New York 6,  
N. Y., for complete information on  
Oakite Stripper S-A.



Technical Service Representatives in  
Principal Cities of U.S. and Canada  
Export Division Cable Address: Oakite

# New Production Ideas

## Equipment, Methods and Services



### Ultrasonic Welder Joins Metals Without Fusion

A new 2000-w welder utilizes ultrasonics to join similar and dissimilar metals without fusion and with very little external deformation. The semi-portable unit has a welding frame of box-beam construction and a hydraulic force system. Its transducer-coupling assembly consists of a nickel transducer, a coupling wedge and a drive reed. The heavy-duty generator, designed for continuous duty, is contained in two separate cabinets with spacing to permit adequate

ventilation. The spot-type welder operates off an ordinary 230-v circuit and consumes a maximum of 3.5 kva, even when joining 0.050-in. 1100 aluminum sheet. The operator simply places the work to be welded between the two welding members and presses a foot switch to initiate the automatic weld cycle. The resulting joints, in many materials, exceed the strength of similar joints made by resistance welding. (Aeroprojects Inc.)

For more data circle No. 49 on postcard, p. 109

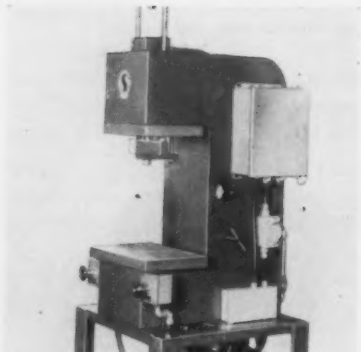


### Midget Precision Nuts Fit Miniaturized Units

A line of standard or special miniature brass nuts are available in production quantities to solve fastening and assembly problems in miniaturized electrical and electronic equipment. These new extra-small machine-turned nuts feature the same accuracy as conventional sizes. They are tapped square with faces to Class 2 tolerances, countersunk on both sides, burrless and degreased. Typical applications in-

clude: Precision instruments, transistorized radio and television sets, business machines, fractional horsepower motors and printed circuitry. The illustration shows 1000-to-1 ratio. The miniature measures  $\frac{1}{8}$  x  $\frac{3}{64}$  in. and weighs only 0.11 lb per 1000. The normal size nut is  $1\frac{1}{16}$  x  $\frac{21}{32}$  in. The miniature nut comes in a range of sizes in standard, cap and knurled thumb types. (Fischer Special Mfg. Co.)

For more data circle No. 50 on postcard, p. 109



### High-Speed Press Features Positive Ram Control

A new concept in the use of compressed air gives positive ram speed and stop control with no overtravel on an air-hydraulic production press. Ram pressure is adjustable from 2 to 12 tons. Ram cycle speed of 2000 minimum per hour with 6 in. stroke is possible, with cooling water unnecessary no matter what the cycle speed. Two-hand safety controls are wired for

either momentary contact through timer control or manual control. Housing is fabricated steel. Total height including stop control is 47 in. Daylight between ram and bottom plate is 12 in., with throat depth  $6\frac{1}{2}$  in. Press is available in  $2\frac{1}{2}$ , 5 and 10 ton capacities. (Studebaker Hydraulic Products Co.)

For more data circle No. 51 on postcard, p. 109

# More of the good things of life come in cans

Cans made of Youngstown high-quality tin plate have brought us thousands of products to make living better and more enjoyable. Packaging manufacturers, using Youngstown tin plate, are continually developing new and improved containers that will, each year, offer us more and more of the good things of life in cans.

THE  
**YOUNGSTOWN**  
SHEET AND TUBE COMPANY

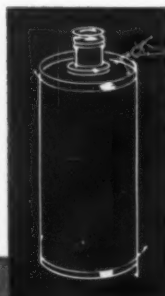


*Manufacturers of Carbon, Alloy and Yaloy Steel, Youngstown, Ohio*

*Aerosol cans, in a wide variety of sizes, are adding pushbutton consumer convenience to dozens of products from spray paints to mothproofing.*



*Easy-to-fill, compact, lightweight dripless cans boost sales of heavy-duty detergents and other liquid products for the home.*



## **How Claude Phillips helped**



More than ten years experience as a welding specialist gave Claude Phillips a sound basic knowledge of metallurgy and grinding methods. In the years since World War II, he has expanded that knowledge into an expert's familiarity with all types of grinding techniques. It is this wide yet concentrated experience that makes him so outstandingly useful to his customers.



# cut stainless steel

## weld-grinding costs

There's nothing delicate about stainless steel until you overheat it. Then you've got a problem... because excessive heat breaks down the chemical structure of the metal and reduces its resistance to corrosion.

Nobody is more conscious of this than Plant Manager John Luker of Gaston County Dyeing Machine Co., Stanley, N. C., and the man who helped him solve the problem... Claude Phillips of Bay State distributor Southern Oxygen Company.

Knowing the job that Bay State Blue Flash R grade wheels had been doing for others, Phillips persuaded Luker and Purchasing

Agent James Stroup to try them. They not only cut cool... comfortably below the 670°F critical limit of stainless... they gave him a higher rate of stock removal than any other wheel on the market. As a result, more work is produced per payroll dollar and there are neither hot spots nor weak spots in Gaston County Dyeing machines.

Like Claude Phillips, your own Bay State distributor is an experienced specialist in grinding problems. Cost-cutting ideas he develops for others may be unexpectedly useful to you, too. Why not get in touch with him and see what he can do? *Better grinding at lower cost—that is his business.*

*Operator uses 9" x 1/8" Blue Flash R grade raised hub disc wheel to blend pressure tank of T-316 stainless. This wheel generates minimum heat yet gives extremely high rate of stock removal.*



# BAY STATE ABRASIVES

Bay State Abrasive Products Co., Westboro, Massachusetts.

In Canada: Bay State Abrasive Products Co., (Canada) Ltd., Brantford, Ontario.

Branch Offices: Bristol, Conn., Chicago, Cleveland, Detroit, Pittsburgh. Distributors: All principal cities.

## NEW EQUIPMENT



### Electrostatic Unit Makes Low-Cost Enlargements

A compact reproduction machine makes enlargements of microfilmed drawings and records at a cost of only a few cents per print. The unit works on a new electrostatic principle to produce permanent black-on-white enlargements of drawings and records. It enlarges microfilm 14 to 16 times to print on standard size sheets ranging from 8½ x 11 in. to 18 x 24 in. With enlarging and printing done continuously, finished prints

roll out a rate of about four per minute. Utilizing a low-cost paper capable of holding an electrostatic charge, the unit is self-contained with two main sections: an enlarger unit which projects the image onto the paper, and a reproduction section. The machine operates on 115-v alternating current and stands 43 in. high, occupying 53 by 32 in. floor space. (Charles Bruning Co., Inc.)

For more data circle No. 52 on postcard, p. 109

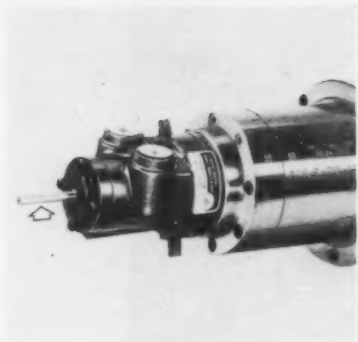


### Heat-Treating Furnace Gets Accurate Control

Extremely accurate temperature control has been developed for a company's line of heat treating furnaces. Electronic control instruments and electrically-operated control valves serve to insure heat treating quality. The furnace shown, designed to fit in limited floor space, is engineered to heat treat all types of water- or oil-hardened steel. Furnace temperature ranges from 1000° to 2400°F. The firing cham-

ber measures 12 in. wide by 10 in. high by 18 in. deep. The tempering oven has a range of 250° to 1100°F and its dimensions are 21 in. wide by 10 in. high by 18 in. deep. Many sizes and shapes of tools, dies and production parts can be heated, quenched and drawn. The unit can be gas-fired or electric. (Waltz Furnace Co.)

For more data circle No. 53 on postcard, p. 109

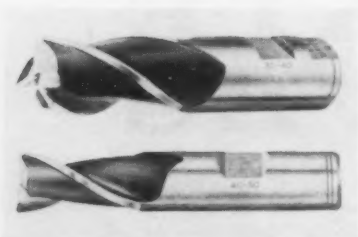


### Extension for Cylinders Actuates and Indicates

A new actuator/indicator rod extension for rotating cylinders actuates limit switches and other control devices and will also indicate piston position. Said to be suitable for use on automatic boring heads, lathes, screw machines and reels, the unit operates any control device requiring normal actuating force. Piloted and pinned to the

piston assembly, the rod protrudes through the inlet housing end cap. Standard rod diameter is ¼ in., with optional plain or threaded end. Rod travel and piston travel are identical and rod lengths are furnished to meet individual requirements. Special O-rings are available. (S. P. Mfg. Corp.)

For more data circle No. 54 on postcard, p. 109



### End Mills Machine High Strength Metals

Two new series of standard end mills cut materials of 30 to 50 Rc hardness. Made of high cobalt and vanadium alloyed steels, the end mills are designed for high speed machining of tough-to-cut,

high strength and heat resistant metals. Both series offer styles and sizes for cavity milling, slotting elongating, surface milling and spot facing. (Illinois Tool Works.)

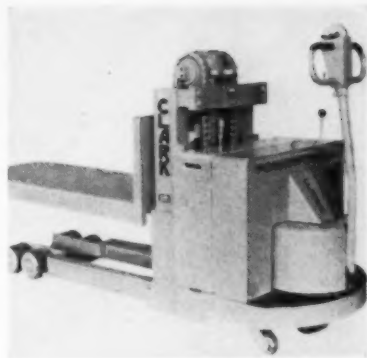
For more data circle No. 55 on postcard, p. 109

## Battery-run Hand Truck Lifts up to 4000 lb

Battery powered, a medium-lift platform truck lifts and hauls skids. The standard truck lifts 4000-lb maximum. However, a special 6000-lb capacity unit is available. Maximum lifting height is 21 in. The skid-carrying platform is 26-in. wide. It comes in 36 to 60-in. lengths, in 6-in. increments. A butterfly switch on the steering handle controls forward and reverse. The steering handle turns 90° in each direction. Brakes apply

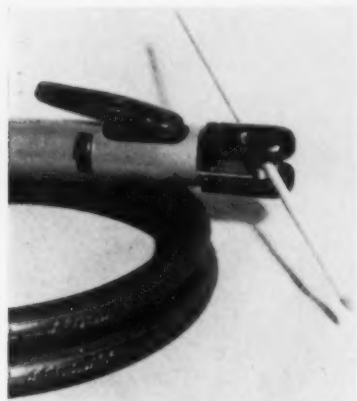
automatically when the steering handle is in either vertical or horizontal position. The handle returns to the vertical position when the operator lets go of it. When he puts on the brakes, the power circuit breaks automatically. Top speed is 2.3 mph loaded lift speed, 12 fpm loaded. Truck weighs 1850 lb by itself. (Clark Equipment Co.)

For more data circle No. 56 on postcard, p. 109



## Metal Removal Torch

Designed for users who have only intermittent applications, a new manual torch is the smallest of a maker's line of equipment. A positive air control valve in the handle permits holding the air



orifice within 4 in. of the work, and operating the unit on as low as 40-psi compressed air. This is exactly half the minimum air pressure used by the larger models. (The Arcair Co.)

For more data circle No. 57 on postcard, p. 109

## Hydraulic Press

A new 1400-ton hydraulic press bonds airframe structures. It's used for bonding together thin gage metal parts which have been preblanked into the desired shape and size. The unit, including tool plates is 58 ft long, while the actual press is 18 ft long by 7 ft wide. Five ram cylinder assemblies are used down the centerline of the slide on the



**THIS MOVE IS EASY . . . THIS MOVE IS NOT**

Go ahead. Move the equipment. You control its operating efficiency. But the man and his family present problems. His efficiency in new surroundings depends upon community acceptance.

### THE HUMAN SIDE OF PLANT LOCATION:

This is where the Carolinas excel. Genuine warmth and friendliness are natural resources. Newcomers know they are welcome right from the beginning.



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Certainly in this industrial climate a plant and its personnel will take root rapidly and grow happily.

## CAROLINA POWER & LIGHT COMPANY

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*Decatur, Indiana*

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## NEW EQUIPMENT

18-ft span. Right to left deflection is at a minimum due to short spans between cylinders. The hot plates



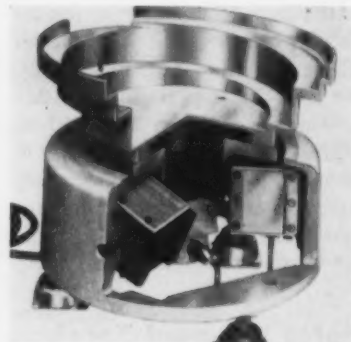
on the press are steam heated to 400°F. (Clearing Machine Corp.)

For more data circle No. 58 on postcard, p. 109

## Vibrating Feeder

Special magnetic motors energize a new feeder to orient and deliver standard parts, plus a variety of parts previously difficult to handle, at speeds up to 80 fpm. In con-

junction with the feeder a wide variety of bowls and transportation rails are available to handle headless set screws, plastic parts, stamp-



ings, wire forms, screw machine parts, cold headed blanks, and powdered metal parts. (Arthur G. Russell Co., Inc.)

For more data circle No. 59 on postcard, p. 109

## Tube Pump

A maker has increased the capacity of its pump line to 246 gpm. The new model is threaded from the side to speed tubing change and eliminate drip. It's said to handle



corrosive and sterile solutions and abrasive slurries virtually without maintenance. Solutions are squeezed through the tube by a double-end ball-bearing rotor. (The Randolph Co.)

For more data circle No. 60 on postcard, p. 109

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more . . . much  
more than a  
mere catalog . . .

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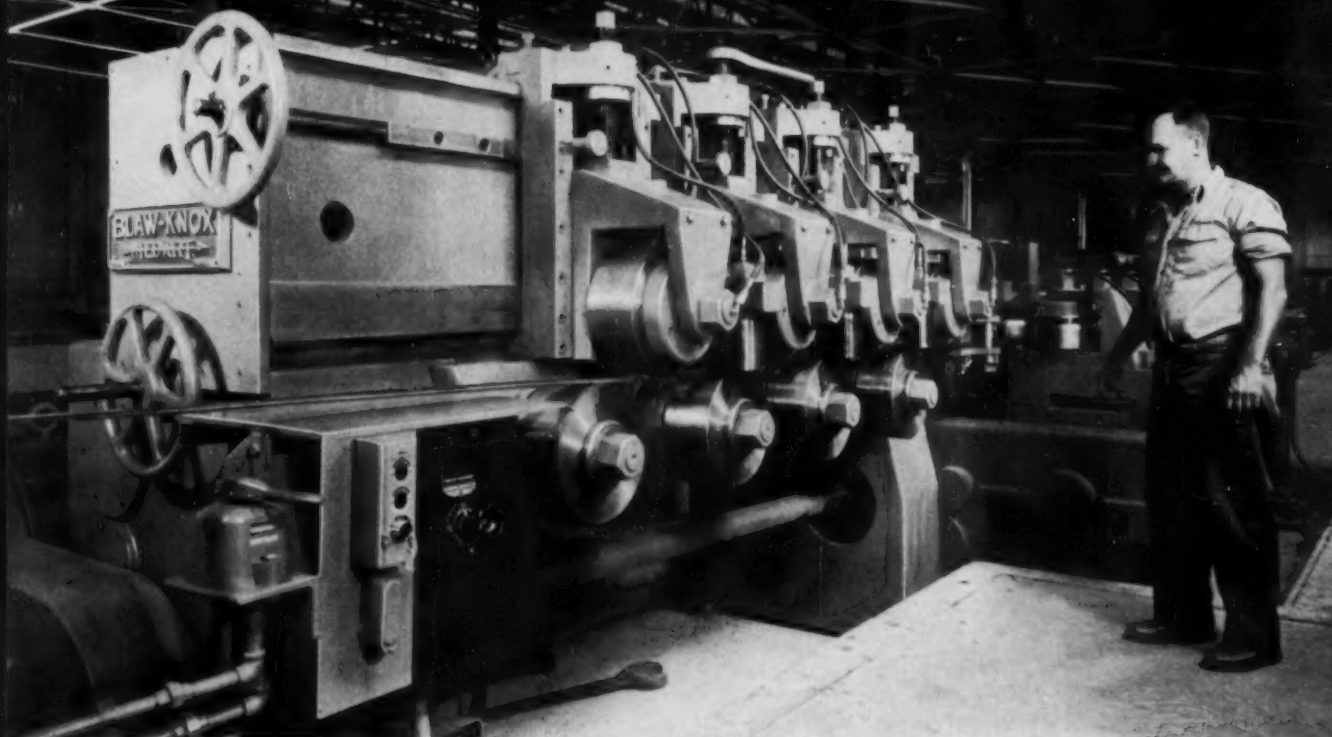
**PRECISION STEEL WAREHOUSE INC.**  
3500 NORTH WOLF ROAD • FRANKLIN PARK, ILLINOIS



## Electric Furnaces

A new series of electric heat-treating furnaces are made in six standard models with heat ranges to 3000°F. The units include an automatic controller, platinum-





This Blaw-Knox Medart two-plane shape straightener processes cold drawn shapes, squares, flats, hexagonals. Variable bending spans of the 16-rolls of this unit give it a wide range of work piece sizes it will straighten.

## There's a **BLAW-KNOX** High Speed Straightener for every type of shaped cross section

No matter what types of hot rolled bars or extruded shapes you handle—bars, coils or cut lengths or coil to coil—there's a Blaw-Knox Medart Shape Straightener especially designed for the job.

These overhung roll, variable center machines combine the versatility of a variable bending span for both driven and bending rolls with the advantage of a quick roll change. The two plane straightener will handle squares, flats and hexagons without changing rolls in either horizontal or vertical effect.

Single plane machines can be equipped with a side adjustment of the bending rolls to give a two plane straightening effect on the work-piece in the single plane.

Other types of Blaw-Knox Medart Shape Straighteners for special work include stretchers for bars and continuous coil-to-coil sheet, and roller levellers.

Contact your Blaw-Knox Medart sales engineer for full details and help in the application of the Blaw-Knox Medart Straightener best suited to your operation.



### **BLAW-KNOX COMPANY**

*Foundry and Mill Machinery Division  
Blaw-Knox Building • 300 Sixth Avenue  
Pittsburgh 22, Pennsylvania*

# How to Design Economical Parts to Withstand Cyclic Stress

Many machine parts are subjected to repeated stress under service conditions. Cyclic loading of this sort frequently imposes a difficult design problem. A metal cannot withstand a repeatedly applied stress as large as the load which it can stand if that load is applied steadily. Thus fatigue limit, rather than tensile strength, or yield point, becomes the most important factor in design and metal selection.

## Fatigue Limit and Fatigue Ratio

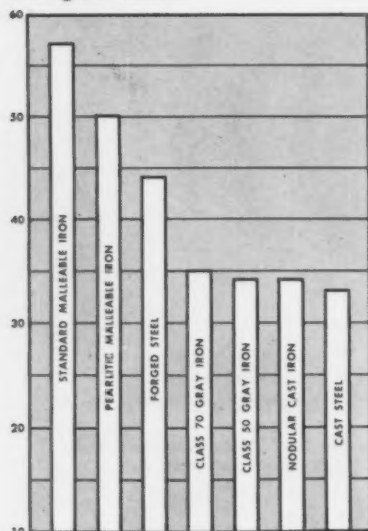


Fig. 1 . . .  
Average fatigue ratios, unnotched.

The fatigue limit of a material is the limiting value of the stress below which it can presumably endure an infinite number of stress cycles. Fatigue limit is determined by applying repeated or reversed cycles of stress in tension, compression, transverse loading, or torsion. Most tests are stopped at ten million cycles if failure has not occurred, and the life of the specimen is then said to be indefinite.

The fatigue or endurance ratios (ratio of fatigue limit to tensile strength) of various metals are shown in Fig. 1. As indicated, the susceptibility of both ferritic and pearlitic malleable irons to progressive fracture is much less than in many other metals. This is attributable to the ferritic matrix which so completely envelopes the temper carbon nodules in the structure.

## Fatigue Characteristics Under Notch Conditions

Whenever design requirements involve radical section changes or sharp internal

corners, low notch sensitivity in the metal being used is extremely valuable.

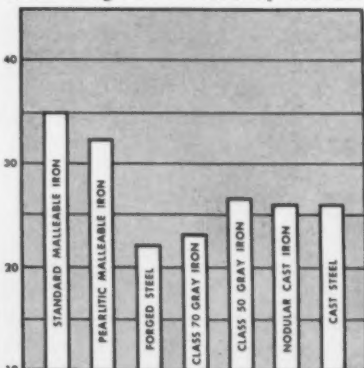


Fig. 2 . . .  
Average fatigue ratios, notched.

Fig. 2 shows average notched fatigue ratios for various metals. Again, the malleable irons are far superior. The fatigue ratio and notch fatigue strength of malleable iron castings become even better by shot peening highly stressed areas.

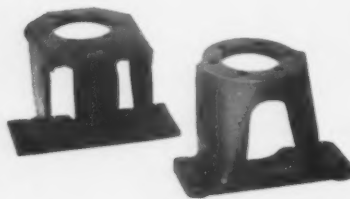


Fig. 3 . . .  
Example of high fatigue resistance.

Good use of malleable's excellent fatigue strength is illustrated in this pump mounting bracket for an agricultural sprayer. The pump is bolted on the top and the drive shaft runs through the large center hole causing continuous cyclic loading. Conversion from a five part weldment with drilled holes to a malleable casting resulted in an increase in fatigue resistance at lower cost. Other advantages are better appearance, elimination of machining and a weight reduction of 22%.

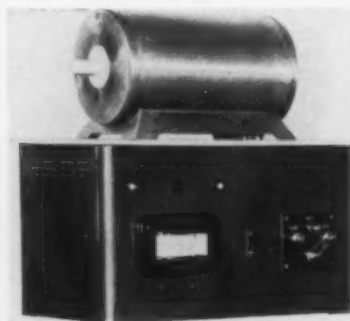
Malleable iron's superior fatigue resistance is just one of the many excellent qualities that help you do a better job with malleable.

## Write for Data Sheet

Comparative information on fatigue characteristics of various metals is available in handy data sheet form for use by design engineers and materials specifiers. For your copy write to **The Malleable Founders Society, 1800 Union Commerce Building, Cleveland 14, Ohio**, or contact any member foundry.

## NEW EQUIPMENT

rhodium thermocouple, magnetic contactor, terminals, aluminum strips for terminal connections, and an element transformer. The series



is available in box or tube type construction. (Lucifer Furnaces, Inc.)

For more data circle No. 61 on postcard, p. 109

## Vacuum Coater

A 72-in. vacuum coater with six stations holds work pieces up to 22 by 50 in. Pump-down time to attain normal working pressure of  $5 \times 10^{-4}$  mm Hg is 5.5 minutes. A complete cycle, from inserting the



work pieces into the vacuum chamber to removal of coated item, has been made with polystyrene parts in 9 minutes. The unit is one of a standard line of coaters. (Consolidated Electrodynamics Corp.)

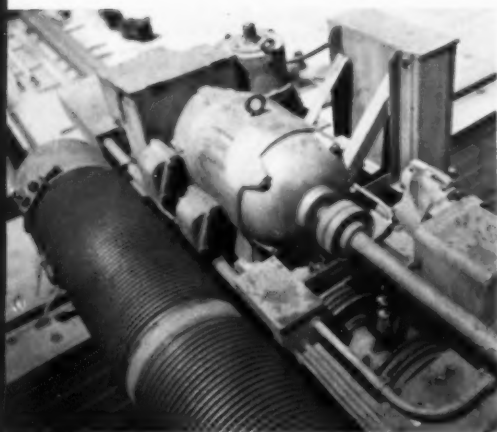
For more data circle No. 62 on postcard, p. 109

## Cleaning Barrel

A new 20-cu ft cleaning barrel is said to increase production and lower production costs while maintaining high cleaning efficiency. A 30-hp motor permits the wheel to throw 50,000 lb of abrasive per hour. It replaces the 15-hp motor



## Norfolk and Western Uses Load-O-Matic for Heavy-Duty Car-Shop Production



50-hp hoist drive unit for this crane includes Westinghouse Life-Line® Motor, d-c self-adjusting brake and rectifiers.

At the Norfolk and Western Railway's main car-shop in Roanoke, Virginia, this modern 25-ton Whiting crane, equipped with Westinghouse Load-O-Matic\* a-c control system, handles heavy plate and other materials for car manufacturing operation.

Because Load-O-Matic is a rugged, yet precision system built to heavy-duty industry standards, it is highly favored for applications that must have long-term, low-cost service, ease of operation and low-maintenance cost.

The Load-O-Matic system with stepless speed control over the full load range eliminates initial cost and complexity of d-c conversion equipment. Components, including controls, motors, brakes and gearing, are Westinghouse Power-Up products, built to work together and backed by Westinghouse unit responsibility.

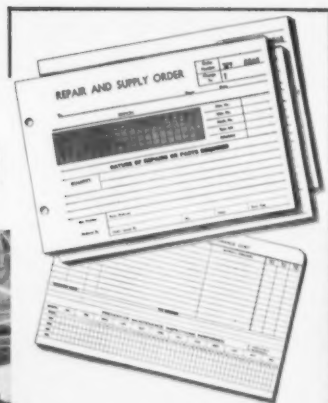
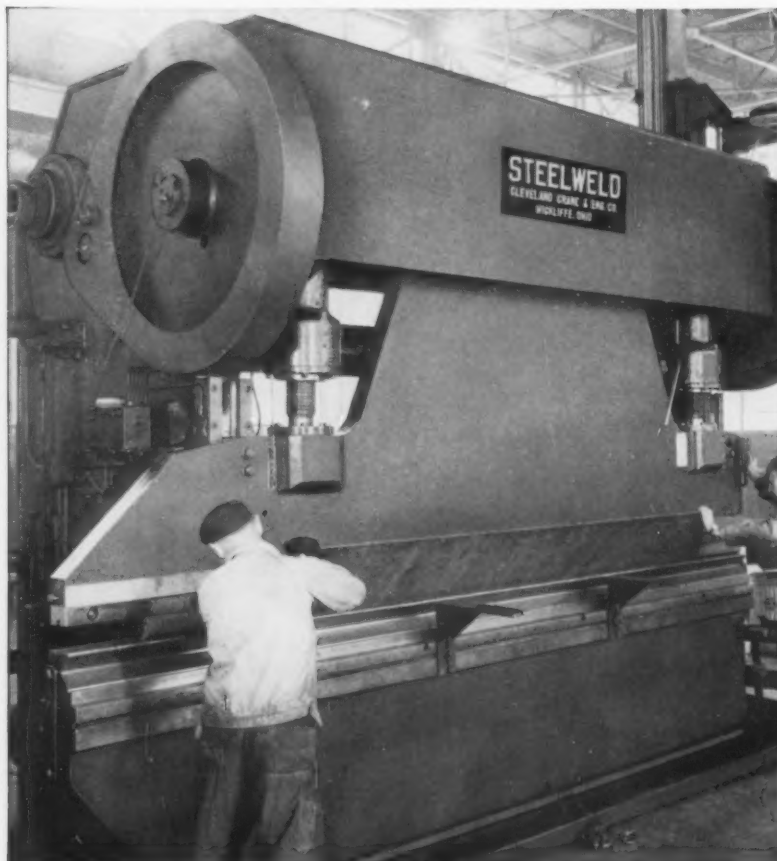
To see Load-O-Matic in operation, call your Westinghouse salesman. For complete information, write Westinghouse Electric Corporation, 3 Gateway Center, P.O. Box 868, Pittsburgh 30, Pa. JI-96125

\*Trade-Mark

**YOU CAN BE SURE... IF IT'S**

# Westinghouse

## Accurate Records Prove LOW COST OPERATION



These forms enable the Chicago Plant to develop records which provide concrete facts on repairs and maintenance for all machines.

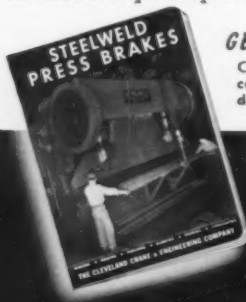
A Steelweld Model J4 1/2-10 press working on various size steel plates up to 16'-0" x 1/4". The ease with which the hand-cranked back gauge is adjusted is a favorable feature. The press is easily jogged in minute amounts. Shown is a 14'-0" x 1/4" plate being formed for a hopper. Link-Belt manufactures a wide variety of conveying and processing equipment such as apron, screw, oscillating and overhead chain trolley conveyors, railroad car dumpers, bucket elevators and other handling equipment.

**S**OME YEARS AGO the Pershing Road Plant of Link-Belt Company, Chicago, established a record system for keeping track of repairs and maintenance costs of all machine tools. This system provides a detailed history of maintenance required and lists every item of expense for every machine.

The record system proves that the maintenance

cost for Steelweld machines, both bending presses and shears, is comparatively low.

Because of this, and the fact that Steelweld machines have many desirable operational features, a number of which are unavailable elsewhere, Link-Belt regards them highly. In fact, so much that 20 Steelweld Presses and Shears are now serving Link-Belt plants in nine cities.



### GET THIS BOOK!

CATALOG No. 2010 gives construction and engineering details. Profusely illustrated.

### THE CLEVELAND CRANE & ENGINEERING CO.

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# STEELWELD

## PRESS BRAKES

BRAKING • FORMING • BLANKING • DRAWING • CORRUGATING • PUNCHING



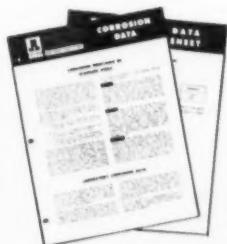


## New Sendzimir Mill

produces stainless steel sheets to extremely close tolerances in widths up to 48 inches

This new Sendzimir mill, complete with annealing, pickling, skin pass and other equipment, was designed and engineered for the exclusive production of the highest quality stainless sheet and strip.

It is located at the Louisville, O., plant of J & L's Stainless and Strip Division. For complete information on the Division's flat rolled stainless products, write our Detroit sales office today.



Write for these Technical Data:  
1. Laboratory Corrosion Data.  
2. Data Sheets (please specify the grades in which you are interested).



Jones & Laughlin Steel Corporation • STAINLESS and STRIP DIVISION • Box 4606, Detroit 34



**YOUR STEEL SERVICE CENTER**



## **COLD FINISHED BARS**

readily available from your Steel Service Center, help keep your inventory costs down, avoid production delays, and free your capital for more productive uses.

# Have you learned the BIG LESSON from this recession?

It's expensive to tie up capital and space in steel stocks! When orders fall off, your cost of ownership—interest, space rental, maintenance, and insurance—continues.

This kind of expense for cold finished bars can be eliminated—or at least reduced substantially—by taking *planned* advantage of the services of your local Steel Service Center, your nearest distributor stocking steel products.

Virtually every steel buyer thinks of his Steel Service Center in an emergency—and this is fine. But even bigger returns may be realized by taking *planned* advantage of your Steel Service Center for your routine purchases.

Your distributor of cold finished bars has a wide variety of shapes, grades and sizes available for prompt delivery, and specialized cut-to-order service takes only a little longer. Plan to use *his* space for your steel stocks, *his* capital for inventory,

*his* equipment, and *his* prompt cut-to-order service—and production coordinated deliveries—for higher productive efficiency. Many others already do—American Steel Warehouse Association figures reveal that over 14 million tons of steel were handled in this manner in 1957.

Steel Service Centers are a vital segment of America's steel distribution system, and the distributor nearest you stocking cold finished bars can help you reduce the cost of your steel ownership. Call in his representative and get the full story on taking *planned* advantage of the services of his firm and its facilities. And ask him to show you the new ASWA slide film presentation, "George Wilkins Fights Back"; you'll find it both interesting and rewarding.

Jones & Laughlin Steel Corporation,  
Dept. 544, Three Gateway Center, Pittsburgh 30, Pennsylvania.



MATERIALS HANDLING EQUIPMENT is expensive—as is the skilled labor to operate it—but you can reduce these costs by taking planned advantage of the services and facilities of your nearest distributor of J&L cold finished bars.

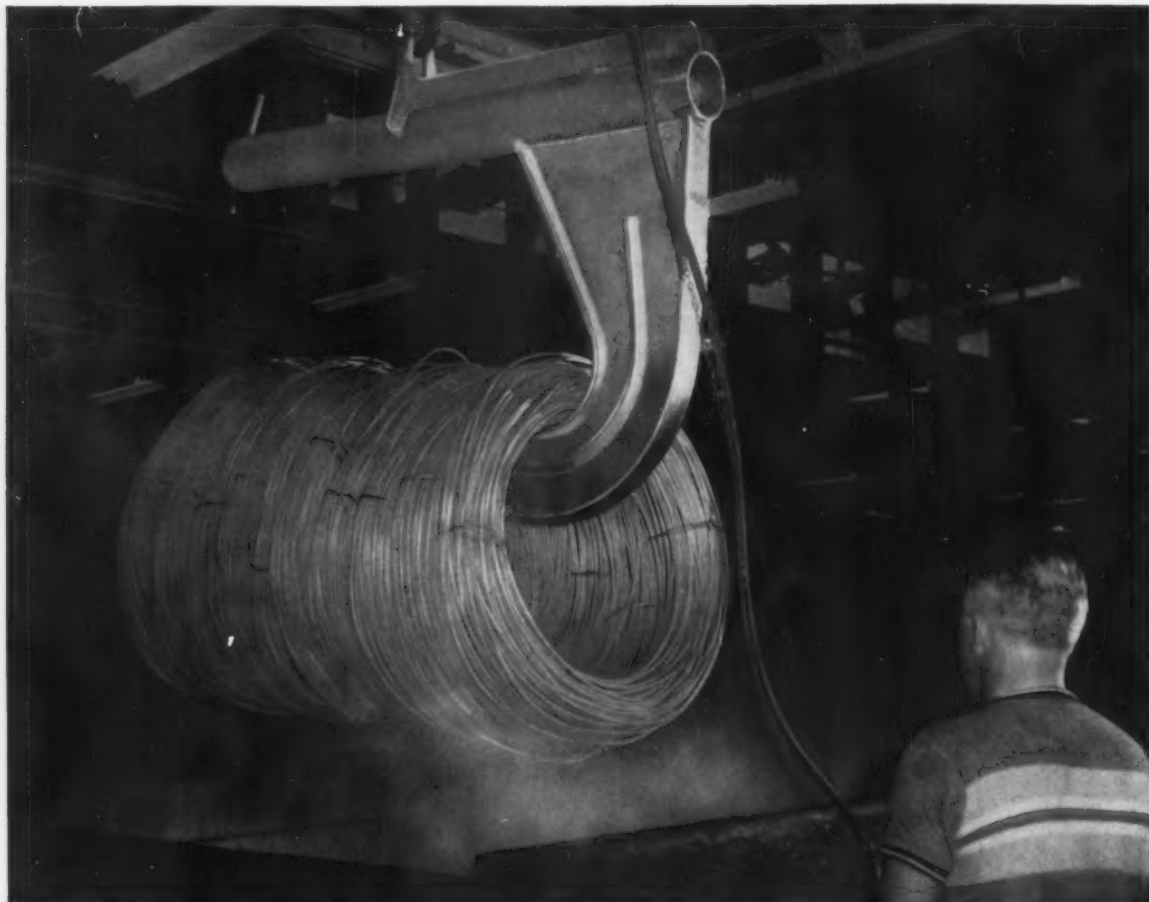


EXACTING QUALITY CONTROL MEASURES assure superior finish, machinability, and uniformity in J&L's cold finished bars. Your J&L distributor has a wide variety of shapes, grades, and sizes available for prompt delivery.



## Jones & Laughlin Steel Corporation

PITTSBURGH, PENNSYLVANIA



**Short ton or a long ton.** No need to be fussy about loading pickling equipment made of Monel alloy. It stays strong. And it's easy to fabricate in heavy struc-

tures like this pickling hook. Hook was designed and built by Youngstown Welding and Engineering, Youngstown, Ohio for Triangle Conduit and Cable Company.

## After 8 years on the pickling line ... this Monel hook is solid all the way through

There's certainty about the strength of a Monel\* nickel-copper alloy pickling hook.

Take the Monel hook above. It's just as solid as it looks ... all the way through. In fact, in this plant a Monel hook has given over eight years of continuous service in 6% sulfuric acid at 140° F. Only minor repairs.

### What makes Monel pickling hooks different?

Monel alloy provides a unique combination of strength and resistance to corrosive attack from sulfuric acid

pickling solutions. It's the strongest non-ferrous metal you can use for pickling. And it outlasts other materials many times over.


Because Monel alloy is strong, you can have pickling hooks that are lighter, carry greater loads with less deadweight. No need to allow extra metal to offset corrosion. And here's another saving: you can easily repair Monel alloy equipment after years of service.

### Monel alloy is a natural for other pickling equipment, too

Monel slings, chains and tie rods are

low in deadweight, tops in corrosion resistance and strength. And in fabricated equipment like baskets, crates and racks, Monel alloy's workability and easy welding properties really pay off. You'll find details about Monel pickling equipment in a 32-page illustrated booklet "Equipping the Pickle House for Greater Production at Lower Cost." For your copy, just write Inco.

\*Registered trademark

**THE INTERNATIONAL NICKEL COMPANY, INC.**  
67 Wall Street  New York 5, N. Y.

# INCO NICKEL ALLOYS



used on the maker's standard 18-cu ft barrel. The new unit, with an extra heavy work conveyor, handles loads up to 3500 lb with single



pieces weighing up to 800 lb each. Abrasive-tight doors and housing retain abrasive within the unit. (Pangborn Corp.)

For more data circle No. 63 on postcard, p. 109

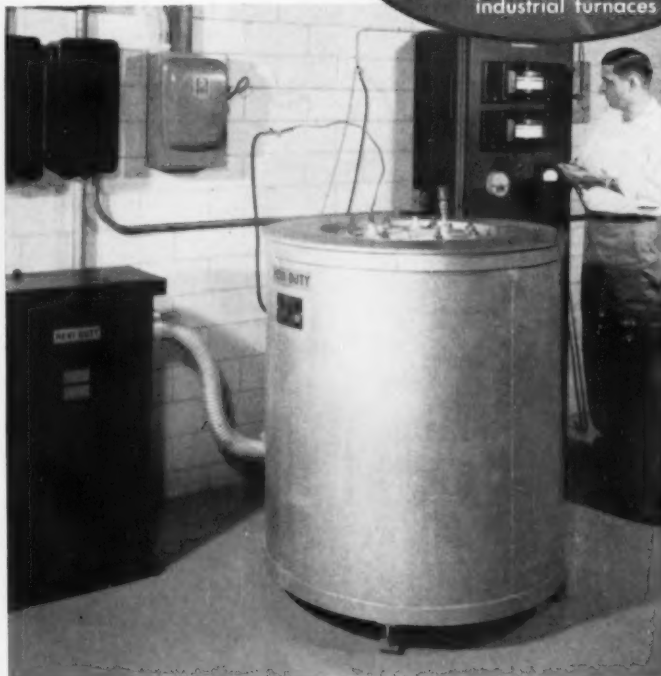
## NEW BOOKS

**"Introduction to Foundry Technology"** is an advanced version of a foundry course manual developed and used at Pennsylvania State University. Very basic in text and easy to understand, it might make a handy book to keep on hand for foundry apprentices. 296 pp. \$7 per copy. McGraw-Hill Book Co., 330 West 42nd St., New York 36.

**"Butt-Welding Ends"** is a new American standard on pipe, valves, flanges and fittings. ASA B16.25-1958. American Society of Mechanical Engineers, 29 West 39th St., New York 18.

**"Transistor Manual"** is a third edition. It's three times the size of the original. Applications alone take 104 pages. \$1 per copy. Semiconductor Products Dept., General Electric Co., Syracuse, N. Y.

**"Modern Chemical Processes (Vol. 5)"** contains, among other items, chapters on tantalum, gold, uranium, boron and phosphorus. \$5 per copy. Reinhold Publishing Corp., 430 Park Ave., New York 22.



## Second retort gives C. P. Clare continuous bright annealing

Two retorts keep this Hevi-Duty pit furnace operating at 2012° F. 24 hours a day at C. P. Clare & Co., Chicago. While one charge of nickel alloy magnets is being bright-annealed under a hydrogen atmosphere, a second loaded retort is slow-cooling, still sealed in atmosphere. Despite the high temperatures and continuous operation, furnace maintenance required has been negligible.

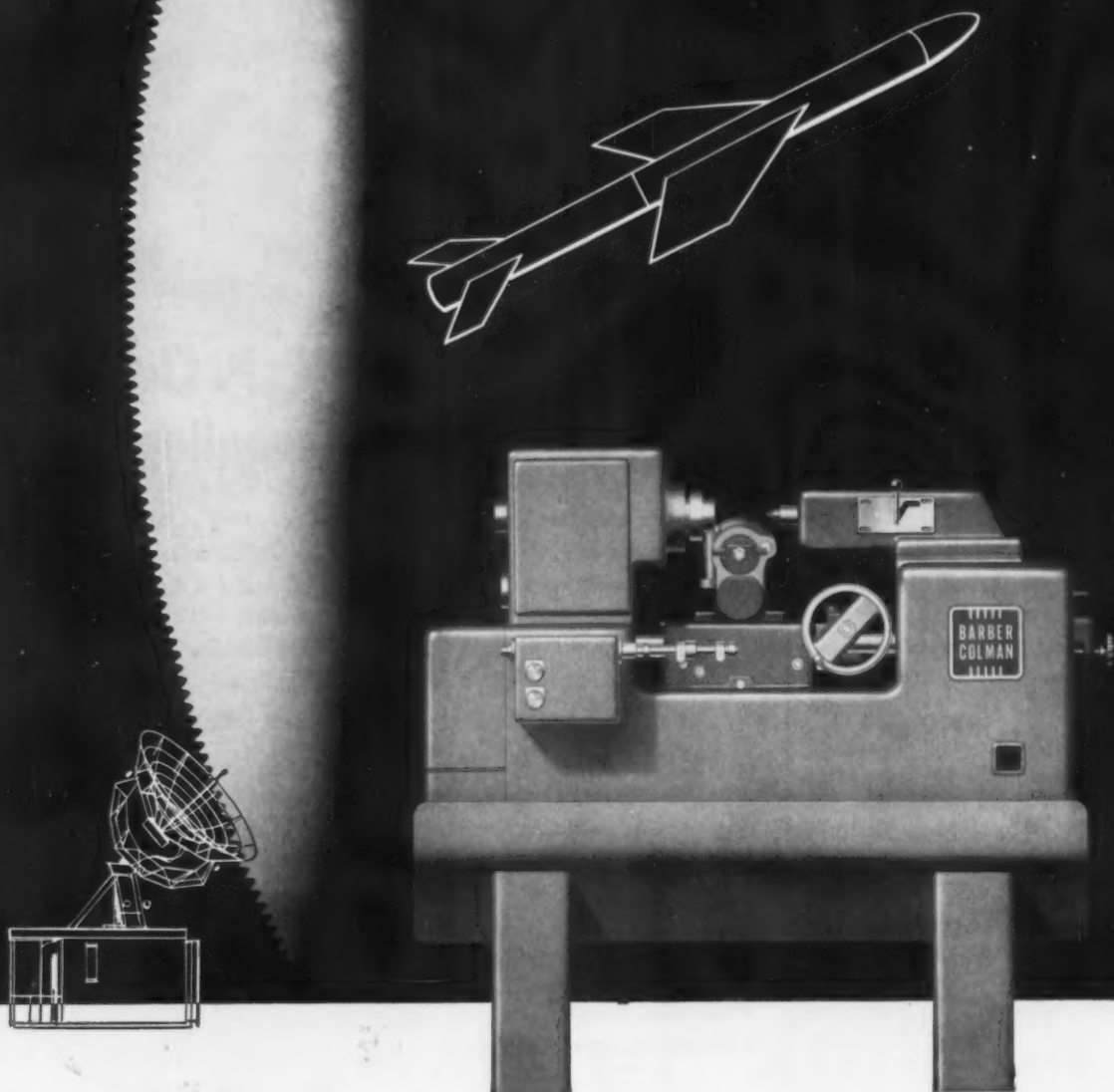
This system has doubled the furnace output with no sacrifice of quality.

The furnace is also ideally suited for copper brazing, carburizing, carbonitriding, nitriding, clean hardening, steam tempering, normalizing and dry cyaniding. For complete details, write for Bulletin 646.

- Industrial Furnaces electric and fuel
- Dry Type Transformers
- Constant Current Regulators



**designed for...**



## **...precision instrument gears**

### *new Barber-Colman hobber guaranteed to index accurately within 20 seconds of arc*

Barber-Colman engineers have developed a new hobbing machine which guarantees indexing accuracy suited to gears used for aircraft, missile and radar guidance systems. This machine is known as the No. 2½-4 hobbing machine and hobs precision spur gears up to 2½" diameter x 2¼" face width, 30 D.P. in steel and 20 D.P. in brass. It provides accuracy, capacity and rigidity for precision fine-pitch work within a nominal price range.

One of the most important features of the new No. 2½-4 hobbing machine is the accuracy of relative rotation between the work spindle and the hob spindle which is guaranteed within 20 seconds of arc. This means that the spacing error on the gear caused by the indexing error of the machine would not exceed .00014" on a 2½" diameter gear.

The machine has a capacity for using 3" diameter hobs providing for a greater number of flutes to produce smooth gear tooth profiles. Using proper care in rigid tooling, accurate blanks, mounting of hob and work, and Class AA hobs with accurate sharpening, precision gears to Class 3 tolerances are hobbled with this machine.

Several design features are a departure from standard hobbing machine construction. There is no hob slide

—only a hob carriage for conventional feed. In place of a hob slide, the hob arbor is mounted on a swivel which adjusts to compensate for hob thread angle. The work slide is stationary, and the hob swivel raises and lowers to meet diameter requirements. The machine has no overarm support, permitting greater work visibility and operator access. Both work and hob spindles are mounted in precision anti-friction bearings to provide accurate rotation at high speeds. The hob carriage also has anti-friction way supports, and the metal-to-metal contact afforded provides more rigidity than obtained with gib-type mounting. An infinite number of hob speeds are provided without change gears in the range of 200 to 1200 r.p.m.

Rigidly constructed, with a steel weldment base and heavy grey iron machine bed, the machine is designed with a minimum number of parts at points where deflection and inaccuracies may occur. Net machine weight without tooling is approximately 1500 lbs. Standard equipment includes motor and controls and one set of change gears.

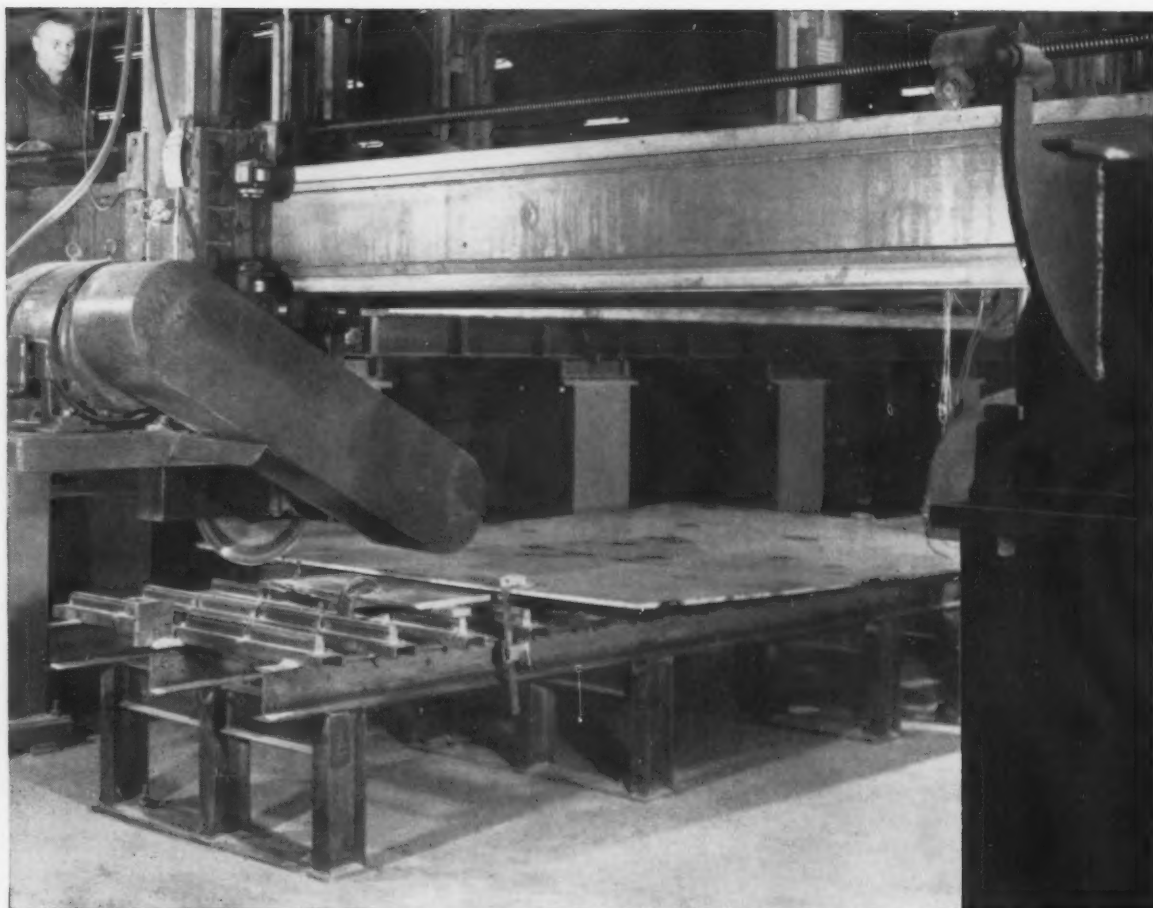
For complete specifications and data contact your nearest Barber-Colman representative, or write directly to the factory for a copy of new bulletin F-8642.

## **BARBER-COLMAN COMPANY**

749 ROCK STREET • ROCKFORD, ILLINOIS

*Hobs • Cutters • Reamers • Hobbing Machines • Hob Sharpening Machines*





This special Ryerson saw assures square, parallel cuts and smooth edges on stainless plate . . . width and length tolerances  $\pm 1/32"$

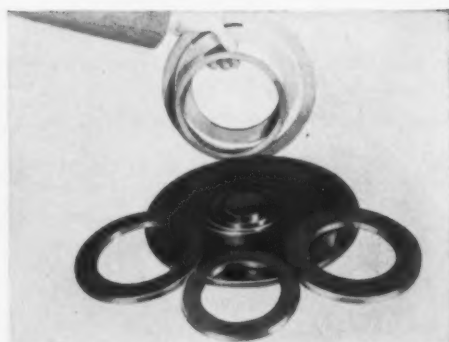
## The plus you get when it's stainless from Ryerson

**WIDEST SELECTION**—No other source comes close to offering a comparable range of stainless types, shapes and sizes—so you can always get exactly what you need.

**UNIQUE SERVICE**—Big-capacity abrasive saw assures the ultimate in cutting accuracy . . . and shearing, hack-sawing and flame-cutting facilities also meet exacting requirements.

**EXPERT TECHNICAL HELP**—Ryerson specialists are always ready to work with you on any problem of stainless selection and fabrication.

No wonder more people buy stainless from Ryerson than from anybody else.



Machine-cut stainless rings and discs from Ryerson are finished parts to your specifications, priced below your own costs.



# RYERSON STEEL®

Member of the **INLAND** Steel Family

*Principal Products: Carbon, alloy and stainless steel,—tubing, bars, structurals, plates, sheets,—aluminum, industrial plastics, metalworking machinery, etc.*  
JOSEPH T. RYERSON & SON, INC. PLANTS AT: NEW YORK • BOSTON • WALLINGFORD, CONN. • PHILADELPHIA • CHARLOTTE • CINCINNATI • CLEVELAND  
DETROIT • PITTSBURGH • BUFFALO • INDIANAPOLIS • CHICAGO • MILWAUKEE • ST. LOUIS • LOS ANGELES • SAN FRANCISCO • SPOKANE • SEATTLE



## The Iron Age Summary

## Mills See Good Fourth Quarter

**Optimism is based on continued pickup in demand from users other than automotive.**

**Any improvement in automotive steel buying will be considered a bonus.**

■ Steel men look for a fairly strong market in the last three months of this year. This optimism is based on the continued pickup in demand from industries other than automotive.

Industries showing a steady improvement from a steel buying standpoint include appliances, construction, and farm implements. Any surge in automotive demand will be considered a bonus.

**Market Is Sound**—Steel sources say the auto industry is still playing its inventories close to the vest. The auto people figure they can afford to wait until the public starts buying cars again in heavier volume. They expect the mills to take care of them should the steel market tighten.

Steel market analysts are cautious about predicting anything more than a "fair-to-good" market over the balance of the year. But nearly everyone agrees that demand is on a sound footing. This is predicated on the knowledge that steel user inventories have been steadily declining, setting the stage for demand in line with the improving economy.

**"Big Push" Next Year**—The "big push" in steel demand probably will come late in the first quarter of 1959. At that time, steel users will begin to worry in earnest over the possibility of a steel strike.

What happened at last week's steel union convention (Page 45) indicates that new contract negotiations next spring will be the toughest in years. On the one hand, steel labor will fight hard to improve steel wage and fringe benefits. At the same time, steel management will be trying to minimize contract improvements to avoid the need for a price hike. The head-on clash will result in some hard bargaining. There could be a strike.

**Fringe Mills Benefit**—Mills on the fringe of the major steel consuming areas are beginning to feel the effect of the pickup in demand. Steel buyers are reaching farther afield in search of quick deliveries as the order books of mills closer to home tighten. It's a question of paying a little more for freight or building up inventories.

Some steel firms this week are running 10 to 15 pct ahead on orders as compared with a month ago. Others are doing even better. A continued improvement is expected through October and November, with a purely seasonally leveling off in December. The ingot rate may hit 75 pct or more before the upswing slackens.

**Mill Buying Pickup**—Meanwhile, the mills themselves are beginning to buy more services and supplies as their own business improves. They are not increasing their inventories in terms of days' supply, but the dollar volume of their buying is picking up.

## Steel Output, Operating Rates

Production (Net tons, 000 omitted)	This Week	Last Week	Month Ago	Year Ago
<b>Ingot Index</b> (1947-1949=100)	111.5	110.8	106.5	131.5
<b>Operating Rates</b>				
Chicago	78.0	78.0*	75.0	85.0
Pittsburgh	62.0	61.0*	55.0	83.5
Philadelphia	73.0	73.5	74.0	90.0
Valley	50.0	52.0*	49.0	74.0
West	80.0	79.0	78.5	97.0
Cleveland	68.0	57.0*	53.0	85.0
Buffalo	59.0	54.0	46.0	100.0
Detroit	53.0	65.0*	67.0	92.0
South	54.0	54.0	53.5	72.5
South Ohio River	73.5	74.0*	77.0	79.0
Upper Ohio River	75.0	70.5*	82.5	98.0
St. Louis	79.0	72.0*	82.0	78.0
<b>Aggregate</b>	67.0	66.0	64.0	82.5

\*Revised

## Prices At a Glance

	This Week	Week Ago	Month Ago	Year Ago
(Cents per lb unless otherwise noted)				
<b>Composite price</b>				
Finished Steel, base	6.196	6.196	6.188	5.967
Pig Iron (gross ton)	\$66.49	\$66.49	\$66.49	\$66.42
Scrap, No. 1 hvy (Gross Ton)	\$43.17	\$43.17	\$42.50	\$43.83
No. 2 bundles	\$29.17	\$29.17	\$29.50	\$33.34
<b>Nonferrous</b>				
Aluminum ingot	26.80	26.80	26.80	28.10
Copper, electrolytic	26.50	26.50	26.50	27.00
Lead, St. Louis	10.80	10.55	10.80	13.80
Magnesium	36.00	36.00	36.00	36.00
Nickel, electrolytic	74.00	74.00	74.00	74.00
Tin, Straits, N. Y.	92.375	95.625	94.75	93.50
Zinc, E. St. Louis	10.00	10.00	10.00	10.00

# How to Pick the Right Adhesive

**Choosing the correct adhesive for proper metal-to-metal bonding isn't easy.**

**Study each application, expert says, and make tests with several before deciding.**

■ Metal-to-metal adhesive bonding is rapidly growing in importance as a design technique. High strength adhesives permit engineers to design stronger, more fatigue resistant joints with thinner, lighter metals.

But getting the most out of metal-to-metal bonding requires more than just replacing another method of joining metal with adhesives, according to E. F. Hess, product manager of the Adhesives, Coatings, and Sealers Div. of Minnesota Mining & Mfg. Co.

**Design Important**—Adhesives seldom display their best properties when substituted directly for other fastenings, he says. Parts to be bonded should be designed to take fullest advantage of the desired properties in selected adhesives.

Mr. Hess warns the important matter of selecting the right adhesive for each type of service is not a simple procedure. There is a great variety of adhesive products, and there is little standardization of their properties.

**Reliance on Specs?**—Many users have resorted to writing their own performance specifications for procurement purposes. Others rely on specifications issued by government agencies. Most adhesive manufacturers are able to provide special assistance in aiding customers establish performance specifications and determining which adhesives are

best suited for the job. Yet for most users, it is largely a process of evaluating several likely adhesives against their known or projected requirements.

**Ample Study Needed**—In any case, applications should be studied to determine which properties and conditions are most important and limiting. And in many cases, Mr. Hess suggests, two or more adhesives should be considered. Sample bonds should be made and exposed to actual or simulated service conditions, and tested to determine actual bond strengths.

**The Big Three**—There are, he says, three general types of adhesives commercially available today that will produce high-strength structural bonds. They are the phenolic-modified elastomers, the phenolic modified vinyls and the epoxy-resin-based compounds. And each type offers certain advantages over the other two.

Phenolic-modified elastomers have good adhesion to most metals and usually offer good flexibility, vibration absorption, and peel strength. They have excellent resistance to fuels, lubricants, humidity, and salt spray. However, this type adhesive has a tendency to creep at elevated temperatures when subjected to dead loads which are in excess of about two-thirds of its shear strength.

**Good and Bad Points**—Modified vinyl phenolics have good adhesion to most metals and offer good shear strengths at room temperatures. Shear strengths are in the range of 2500 to 5000 psi on aluminum. Curing times, temperature, and pressure are lower than for the phenolic-modified elastomers.



**FIRM CHOICE:** Aluminum plates of film holder are bonded together quickly and easily with adhesives. (Minnesota Mining and Mfg. Co. photo.)

# Vendo puts efficiency into handling...

**FROM VENDING  
COFFEE  
WITH  
THEIR  
MACHINES**



At the drop of a coin the Vendo Coffee Maker instantly produces a cup, pours hot coffee — here's material handling at its automatic best.

But Vendo Manufacturing Company, world's largest producer of vending machines, is also concerned with efficient movement of material within its own plant. For this task a fleet of Allis-Chalmers lift trucks is used.

These trucks are constantly on the go, moving everything from nuts and bolts to fabricated steel parts, spotting 16,000-lb dies with pin-point accuracy, maneuvering through cramped quarters with ease, carefully handling finished goods to prevent damage. They are essential to the efficient operation of Vendo's modern Kansas City plant.

Best of all, their durability and ease of servicing are excellent. As Clyde Hickman, foreman of the Material Handling Department, puts it, "A lift truck has to keep moving or you lose money — and ours keeps moving."

Let your Allis-Chalmers material handling dealer show how you can put greater efficiency into your handling.

ALLIS-CHALMERS, ENGINE - MATERIAL HANDLING DIVISION,  
MILWAUKEE 1, WISCONSIN

**TO MOVING MATERIALS  
WITH ALLIS-CHALMERS  
LIFT TRUCKS**



John Cromer, operator, says, "I like the way an Allis-Chalmers lift truck performs. I like the transmission. I like the way it handles. I just like the whole machine!"



Clyde Dent, mechanic, says, "Maintenance expenses are low. We have had no part changes so far. That Allis-Chalmers engine is wonderful. It is easily overhauled and has a world of power."



"We tried out Allis-Chalmers fork lifts along with other makes," said J. H. Pearce, production supt. "Reports from the drivers, maintenance men and material handling supervisors showed they all preferred this equipment."



George Lee Sigloch, operator, says, "It's a work horse. We have to spot all of the heavy dies and it really handles nice."

**ALLIS-CHALMERS**



# Tinplate Prices Rise 35¢ a Base Box

On Nov. 1 U. S. Steel will increase base prices of electrolytic and hot dipped tinplate, black plate and terne plate.

Price advance is the first in eighteen months for tinmill products.

■ Tinplate product prices are going up for the first time in a year and a half.

Increases for electrolytic and hot dipped tinplate, terne plate, and canmaking blackplate have been announced by U. S. Steel Corp. The changes — effective Nov. 1 — will boost mill base prices on these products at Gary, Irvin, Fairless, and Fairfield producing points by 35 cents per base box.

At the same time the Columbia-Geneva Steel Div. of the Corporation will raise mill base prices 25

cents a base box at its Pittsburgh, Calif. plant.

Other tinplate producers are expected to duplicate U. S. Steel's action. The last advance in tinmill products came in April, 1957. It was also 35 cents a base box.

U. S. Steel says the latest changes will mean an average increase of 3½ pct on the total price—base price plus extras — of its tinplate products. The Corporation will also make revisions, both upward and downward, in its tinmill extra charges and deductions.

**Sheet and Strip** — Neither auto labor troubles nor contract settlements appear to be having much effect on steel orders. Mills say automakers have October tonnages in and are not likely to change them now. Steel producers believe the auto firms are committed to a more level and leisurely production pace

—avoiding buildups of either cars or steel. This may mean sheet shipments will level off in November and December. But it also may mean that shipments won't slump as they did in fourth quarter, 1957.

**Bar**—Hot-rolled bar orders are steadily improving. September shipments for one large Pittsburgh supplier are 10 to 15 pct above August. At Cleveland, September tonnages are at least 10 pct over August levels. Settlement of auto labor difficulties may boost October orders above rates for this month.

Hot-rolled bar deliveries at Chicago have stretched out a week.

**Plates and Shapes** — Makers of plates and structurals are looking for improvement in October following a disappointing September. They had expected the month to show an advance over August. But orders lagged and the two months were about even. Sales of wide-flanged beams, in particular, have been slow.

**Steel Service Centers** — Other Boston area distributors, including Joseph T. Ryerson & Sons and U. S. Steel Supply, have switched to the single zone pricing system established several weeks ago by W. E. Clark & Co., Everett, Mass. (See The IRON AGE, Sept. 11, p. 127.)

Service Centers are adopting for cold-rolled sheet the quantity deductions and small quantity extra charges recently announced for hot-rolled sheet. Quantity deductions for galvanized sheet have not been changed.

**Wire Products** — Producers are now operating at about 60 pct of capacity on an overall industry basis. This is an increase of at least 10 points above mid-summer levels. Merchant wire products are showing some gains as their season draws to a close. Manufacturer's wire continues making slow gains. Deliveries are at a three-week minimum in the Midwest. Wire rod orders in that area are good. One mill is 75 pct booked for October.

## Delivery Promises at a Glance

	Pittsburgh	Chicago	Cleveland	Detroit	East	West Coast
CR Carbon Sheet	3-5 wks	5-7 wks	3-4 wks	3-5 wks	5 wks	6 wks
HR Carbon Sheet	2-3 wks	5-7 wks	2-3 wks	2-3 wks	3 wks	3-4 wks
CR Carbon Strip	3-5 wks	4-6 wks	3-4 wks	3-5 wks	5 wks	4-6 wks
HR Carbon Strip	2-3 wks	4-6 wks	2-3 wks	2-3 wks	3 wks	3-4 wks
HR Carbon Bars	1-2 wks	4 wks	2-3 wks	2-4 wks	2-4 wks	2-3 wks
CF Carbon Bars	1-4 wks	3-6 wks	1-3 wks	1-4 wks	1-3 wks	1-2 wks
Heavy Plate	1-4 wks	3-4 wks			3 wks	4-6 wks
Light Plate	1-2 wks	3-4 wks	2-3 wks		2-3 wks	4-6 wks
Merchant Wire	1 wk	1-3 wks	1 wk		Stock	3-4 wks
Oil Country Goods	Stock	1-2 wks	Stock		Stock	
Linepipe	2-8 wks	4-6 wks	Stock		2-4 wks	4-6 wks
Buttweld Pipe	Stock	3-5 wks	Stock	Stock	Stock	2-4 wks
Std. Structurals	1-4 wks	2-5 wks		1-4 wks	2-4 wks	4 wks
CR Stainless Sheet	1-4 wks		2-3 wks	1-2 wks	2-3 wks	
CR Stainless Strip	1-4 wks		2-3 wks	1-2 wks	2-3 wks	



# COMPARISON OF PRICES

(Effective Sept. 23, 1958)

Steel prices on this page are the average of various f.o.b. quotations of major producing areas: Pittsburgh, Chicago, Gary, Cleveland, Youngstown.

Price advances over previous week are printed in **Heavy Type**; declines appear in *Italics*.

	Sept. 23 1958	Sept. 16 1958	Aug. 26 1958	Sept. 24 1957
<b>Flat-Rolled Steel:</b> (per pound)				
Hot-rolled sheets	5.10¢	5.10¢	5.10¢	4.925¢
Cold-rolled sheets	6.275	6.275	6.275	6.06
Galvanized sheets (10 ga.)	6.875	6.875	6.875	6.60
Hot-rolled strip	5.10	5.10	5.10	4.925
Cold-rolled strip	7.425	7.425	7.425	7.17
Plate	5.30	5.30	5.30*	5.12
Plate, wrought iron	13.55	13.55	13.55	13.16
Stainl's C-R strip (No. 302)	52.00	52.00	52.00	52.00
<b>Tin and Terneplate:</b> (per base box)				
Tinplate (1.50 lb.) cokes	\$10.30	\$10.30	\$10.30	\$10.30
Tin plates, electro (0.50 lb.)	9.00	9.00	9.00	9.00
Special coated mfg. terms	9.55	9.55	9.55	9.55
<b>Bars and Shapes:</b> (per pound)				
Merchant bar	5.675¢	5.675¢	5.675¢	5.425¢
Cold finished bar	7.65	7.65	7.65	7.30
Alloy bars	6.725	6.725	6.725	6.475
Structural shapes	5.50	5.50	5.50	5.275
Stainless bars (No. 302)	45.00	45.00	45.00	45.00
Wrought iron bars	14.90	14.90	14.90	14.45
<b>Wire:</b> (per pound)				
Bright wire	8.00¢	8.00¢	8.00¢	7.65¢
<b>Nails:</b> (per 100 lb.)				
Heavy nails	\$5.75	\$5.75	\$5.525	\$5.525
Light nails	6.725	6.725	6.50	6.50
<b>Semifinished Steel:</b> (per net ton)				
Rerolling billets	\$80.00	\$80.00	\$80.00	\$77.50
Slabs, rerolling	80.00	80.00	80.00	77.50
Forging billets	99.50	99.50	99.50	96.00
Alloy blooms, billets, slabs	119.00	119.00	119.00	114.00
<b>Wire Rods and Skelp:</b> (per pound)				
Wire rods	6.40¢	6.40¢	6.40¢	6.15¢
Skelp	5.05	5.05	5.05	4.875
<b>Finished Steel Composite:</b> (per pound)				
Base price	6.196¢	6.196¢	6.188¢	5.967¢

## Finished Steel Composite

Weighted index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold rolled sheets and strips.

## Pig Iron Composite

Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

## Steel Scrap Composite

Averages of No. 1 heavy melting steel scrap delivered to consumers at Pittsburgh, Philadelphia and Chicago.

## Pig Iron: (per gross ton)

	Sept. 23 1958	Sept. 16 1958	Aug. 26 1958	Sept. 24 1957
Foundry, del'd Phila.	\$70.97	\$70.97	\$70.97	\$70.51
Foundry, Valley	66.50	66.50	66.50	66.50
Foundry, Southern Cin'ti	73.87	73.87	73.87	71.65
Foundry, Birmingham	62.50	62.50	62.50	62.50
Foundry, Chicago	66.50	66.50	66.50	66.50
Basic, del'd Philadelphia	70.47	70.47	70.47	70.01
Basic, Valley furnace	66.00	66.00	66.00	66.00
Malleable, Chicago	66.50	66.50	66.50	66.50
Malleable, Valley	66.50	66.50	66.50	66.50
Ferromanganese 74-76 pct Mn,				
cents per lb½	12.25	12.25	12.25	12.25

## Pig Iron Composite: (per gross ton)

Pig iron	\$66.49	\$66.49	\$66.49	\$66.42
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## Scrap: (per gross ton)

No. 1 steel, Pittsburgh	\$44.50	\$44.50	\$44.50	\$44.50
No. 1 steel, Phila. area	39.50	39.50	38.50	42.50
No. 1 steel, Chicago	45.50	45.50	44.50	44.50
No. 1 bundles, Detroit	36.50	36.50	37.50	41.50
Low phos., Youngstown	45.50	45.50	46.50	44.00
No. 1 mach'y cast, Pittsburgh	51.50	51.50	51.50	55.50
No. 1 mach'y cast, Phila.	49.50	49.50	49.50	56.50
No. 1 mach'y cast, Chicago	53.50	53.50	53.50	46.50

## Steel Scrap Composite: (per gross ton)

No. 1 hvy. melting scrap	\$43.17	\$43.17	\$42.50	\$43.83
No. 2 bundles	29.17	29.17	29.50	33.34

## Coke, Connellsville: (per net ton at oven)

Furnace coke, prompt	\$14.50	\$14.50	\$14.50	\$15.38
Foundry coke, prompt	\$18-18.50	\$18-18.50	\$18-18.50	\$17.50-\$19

## Nonferrous Metals: (cents per pound to large buyers)

Copper, electrolytic, Conn.	26.50	26.50	26.50	27.00
Copper, Lake, Conn.	26.50	26.50	26.50	27.00
Tin, Straits, N. Y.	92.375¢	95.625	94.75	93.50
Zinc, East St. Louis	10.00	10.00	10.00	10.00
Lead, St. Louis	10.80	10.55	10.80	13.80
Aluminum, virgin ingot	26.80	26.80	26.80	28.10
Nickel, electrolytic	74.00	74.00	74.00	74.00
Magnesium, ingot	36.00	36.00	36.00	36.00
Antimony, Laredo, Tex.	29.50	29.50	29.50	33.00

† Tentative. ‡ Average. \* Revised.

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Write For Bulletin 64-N

**Thermo Electric** CO., INC.  
SADDLE BROOK, NEW JERSEY

In Canada:  
**THERMO ELECTRIC (Canada) LTD.**  
Brampton, Ont.

# Fall Upturn Depends On October

**It could have been worse, but September was a bust to the scrap trade generally.**

**Dealers are loaded with inventory. They still hope for a big October.**

■ September has been pretty much of a disappointment to the scrap trade. Prices managed to get off the bottom, but not much further. The mills aren't buying and no runaway market is in sight at this point.

In most districts, dealers are still optimistic about October, but there are signs that some can't hold out for higher prices much longer. Distress tonnages are being let go more frequently.

Those who are in better shape are refusing to sell at lower prices. Yet brokers report they have no trouble buying at quoted prices.

In face of the uncertain picture for scrap, The IRON AGE Heavy Melting Composite Price was unchanged at \$43.17.

Starting this issue, the Houston scrap market will be covered in The IRON AGE, recognizing the growing importance of metalworking in the Southwest.

**Pittsburgh**—Prices of the best scrap grades are holding firm. But secondary openhearth grades are off \$1. The abundance of secondary grades coupled with lack of mill demand has brought pressure to sell. There's not enough activity to test the market but brokers say they can buy readily for \$1 less. Demand for No. 1 heavy melting and electric furnace bundles is lagging also but

stocks of these grades are less plentiful. A special quality of No. 1 heavy melting has been moving slowly at a mill price of \$46.50. There is still no mill interest in turnings. Cast is off.

**Chicago**—Mills here continued to buy quietly, apparently on the assumption that a purchase in major quantities would trigger fresh market increases. As a result, scrap showed no major gains although the market continues strong at existing price levels. An exception is mixed borings and turnings, which sold for \$1 under last week's price. Renewed broker pressure to hold dealer prices at a lower level have met with little success. Attempts by mills to buy at \$1 to \$2 under the market also have failed. Rerolling rails was incorrectly quoted last week. Correct price was \$66-\$67.

**Philadelphia**—Brokers have little trouble buying scrap at quoted prices, but they're not buying much. Mills have not yet started buying in quantity and it appears their October demands will not be high. Prices are unchanged.

**New York**—Prices for No. 1 and No. 2 heavy melting zoomed as much as \$5 a ton in the last week. No. 1 steel is now at a top of \$34 and No. 2 at \$30. No. 2 bundles, while less active, also rose \$2 to a peak of \$20. Turnings joined with a climb of \$1 to \$2 depending on grade. Most stainless prices are up \$5. Rise in steelmaking scrap is attributed to a combination of export and domestic buying. Optimism over Detroit labor settlement is having effect.

**Detroit**—Scrap is beginning to pile up here—a situation that is dampening dealer optimism. Continuation of a strike in Canada keeps that market closed. A local mill placed an embargo on scrap last week as loaded cars filled its tracks. And despite a contract agreement at Ford, dissatisfaction on the part of coke oven workers there disrupted steel production.

**Cleveland**—Prices of most grades are holding here and in the Valley. There is talk of greater activity but new orders are yet to come. On the other hand, brokers can't buy under current price levels.

**St. Louis**—Prices are unchanged in a firm market. Railroad lists closing this week may change the price picture, however. One of two furnaces down for two weeks was back in operation.

**Cincinnati**—The market here is quiet but strong. Price of No. 1 heavy melting is up \$1 as brokers are bidding higher for material in anticipation of mill orders. On the basis of local sales, low phos and random length rails are up \$1 and \$2.

**Birmingham**—Few sales of scrap were reported here in the past 10 days. With the exception of cast car wheels, prices are unchanged. The trade is optimistic about October business.

**Buffalo**—Primary openhearth grades dropped \$1 in a quiet market. But a sale of cupola cast was made at \$3 above quoted prices.

**Boston**—There is a firm undertone to this market, even though little scrap is changing hand. Dealers are optimistic.

**West Coast**—Japan has ordered 75,000 tons of scrap from this area by year's end. Dealers believe that normal flow of scrap will take care of these orders without upsetting the market.

**Houston**—The steel scrap market is firm, but cast grades appear to be weakening. Little scrap of any kind is moving. Rain and crop harvesting have cut into collections.

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## SCRAP PRICES (Effective Sept. 23, 1958)

### Pittsburgh

No. 1 hvy. melting	\$44.00 to \$45.00
No. 2 hvy. melting	32.00 to 33.00
No. 1 dealer bundles	44.00 to 45.00
No. 1 factory bundles	48.00 to 49.00
No. 2 bundles	30.00 to 31.00
No. 1 busheling	44.00 to 45.00
Machine shop turn.	20.00 to 21.00
Shoveling turnings	24.00 to 25.00
Cast iron borings	24.00 to 25.00
Low phos. punch'g plate	49.00 to 50.00
Heavy turnings	34.00 to 35.00
No. 1 RR hvy. melting	48.00 to 49.00
Scrap rails, random lgth.	54.00 to 55.00
Rails 2 ft and under	57.00 to 58.00
RR specialties	52.00 to 53.00
No. 1 machinery cast.	51.00 to 52.00
Cupola cast.	44.00 to 45.00
Heavy breakable cast.	42.00 to 43.00
Stainless	
18-8 bundles and solids	225.00 to 230.00
18-8 turnings	120.00
430 bundles and solids	120.00 to 125.00
430 turnings	50.00 to 60.00

### Chicago

No. 1 hvy. melting	\$45.00 to \$46.00
No. 2 hvy. melting	38.00 to 40.00
No. 1 dealer bundles	45.00 to 46.00
No. 1 factory bundles	50.00 to 51.00
No. 2 bundles	31.00 to 32.00
No. 1 busheling	45.00 to 46.00
Machine shop turn.	23.00 to 24.00
Mixed bor. and turn.	24.00 to 25.00
Shoveling turnings	25.00 to 26.00
Cast iron borings	25.00 to 26.00
Low phos. forge crops	54.00 to 55.00
Low phos. punch'g plate	51.00 to 52.00
No. 1 RR hvy. melting	49.00 to 50.00
Scrap rails, random lgth.	54.00 to 55.00
Re-rolling rails	68.00 to 67.00
Rails 2 ft and under	60.00 to 61.00
Angles and splice bars	56.00 to 57.00
RR steel bar axles	71.00 to 72.00
RR couplers and knuckles	53.00 to 54.00
No. 1 machinery cast.	53.00 to 54.00
Cupola cast.	47.00 to 48.00
Heavy breakable cast.	41.00 to 42.00
Cast iron wheels	41.00 to 42.00
Malleable	57.00 to 58.00
Stove plate	44.00 to 45.00
Steel car wheels	52.00 to 53.00
Stainless	
18-8 bundles and solids	215.00 to 220.00
18-8 turnings	125.00 to 130.00
430 bundles and solids	115.00 to 120.00
430 turnings	70.00 to 75.00

### Philadelphia Area

No. 1 hvy. melting	\$39.00 to \$40.00
No. 2 hvy. melting	35.00 to 36.00
No. 1 dealer bundles	39.00 to 40.00
No. 2 bundles	24.00 to 25.00
No. 1 busheling	39.00 to 40.00
Machine shop turn.	20.00 to 21.00
Mixed bor. short turn.	20.00 to 21.00
Cast iron borings	20.00 to 21.00
Shoveling turnings	23.00 to 24.00
Clean cast. chem. borings	30.00 to 31.00
Low phos. 5 ft and under	42.00 to 43.00
Low phos. 2 ft, punch'g	43.00 to 44.00
Elec. furnace bundles	40.00 to 41.00
Heavy turnings	34.00 to 35.00
RR specialties	44.50 to 45.50
Rails 18 in. and under	57.00 to 58.00
Cupola cast.	39.00 to 40.00
Heavy breakable cast.	43.00 to 44.00
Cast iron car wheels	44.00 to 45.00
Malleable	56.00 to 57.00
No. 1 machinery cast.	49.00 to 50.00

### Cincinnati

Brokers buying prices per gross ton on cars:	
No. 1 hvy. melting	\$39.50 to \$40.50
No. 2 hvy. melting	33.50 to 34.50
No. 1 dealer bundles	39.50 to 40.50
No. 2 bundles	25.00 to 26.00
Machine shop turn.	18.00 to 19.00
Shoveling turnings	20.00 to 21.00
Cast iron borings	17.00 to 18.00
Low phos. 18 in. and under	45.00 to 46.00
Rails, random length	48.00 to 49.00
Rails, 18 in. and under	55.00 to 56.00
No. 1 cupola cast.	42.00 to 43.00
Hvy. breakable cast.	36.00 to 37.00
Drop broken cast.	47.00 to 48.00

### Youngstown

No. 1 hvy. melting	\$44.00 to \$45.00
No. 2 hvy. melting	36.00 to 37.00
No. 1 dealer bundles	44.00 to 45.00
No. 2 bundles	29.00 to 30.00
Machine shop turn.	20.50 to 21.50
Shoveling turnings	24.50 to 25.50
Low phos. plate	45.00 to 46.00

## Iron and Steel Scrap

Going prices of iron and steel scrap as obtained in the trade by THE IRON AGE based on representative tonnages. All prices are per gross ton delivered to consumer unless otherwise noted.

### Cleveland

No. 1 hvy. melting	\$40.50 to \$41.50
No. 2 hvy. melting	32.50 to 33.50
No. 1 dealer bundles	40.50 to 41.50
No. 1 factory bundles	45.00 to 46.00
No. 2 bundles	27.50 to 28.50
No. 1 busheling	40.50 to 41.50
Machine shop turn.	17.00 to 18.00
Mixed bor. and turn.	21.00 to 22.00
Shoveling turnings	21.00 to 22.00
Cast iron borings	21.00 to 22.00
Cut structural & plates, 2 ft & under	46.00 to 47.00
Drop forge flashings	40.50 to 41.50
Low phos. punch'g plate	41.50 to 42.50
Foundry steel, 2 ft & under	40.00 to 41.00
No. 1 RR hvy. melting	47.00 to 48.00
Rails 2 ft and under	56.00 to 57.00
Rails 18 in. and under	57.00 to 58.00
Steel axle turnings	25.00 to 26.00
Railroad cast.	49.00 to 50.00
No. 1 machinery cast.	48.00 to 49.00
Stove plate	44.00 to 45.00
Malleable	61.00 to 62.00
Stainless	
18-8 bundles	215.00 to 220.00
18-8 turnings	105.00 to 110.00
430 bundles	110.00 to 115.00

### Buffalo

No. 1 hvy. melting	\$36.00 to \$37.00
No. 2 hvy. melting	29.00 to 30.00
No. 1 busheling	36.00 to 37.00
No. 1 dealer bundles	36.00 to 37.00
No. 2 bundles	27.00 to 28.00
Machine shop turn.	16.00 to 17.00
Mixed bor. and turn.	18.00 to 19.00
Shoveling turnings	22.00 to 23.00
Cast iron borings	16.00 to 17.00
Low phos. plate	40.00 to 41.00
Structurals and plate, 2 ft and under	45.00 to 46.00
Scrap rails, random lgth.	47.00 to 48.00
Rails 2 ft and under	59.00 to 60.00
No. 1 machinery cast.	48.00 to 49.00
No. 1 cupola cast.	44.00 to 45.00

### St. Louis

No. 1 hvy. melting	\$38.00 to \$39.00
No. 2 hvy. melting	36.00 to 37.00
No. 1 dealer bundles	40.00 to 41.00
No. 2 bundles	29.00 to 30.00
Machine shop turn.	16.00 to 17.00
Shoveling turnings	18.00 to 19.00
No. 1 RR hvy. melting	46.00 to 47.00
Rails, random lengths	48.00 to 49.00
Rails, 18 in. and under	53.00 to 54.00
Angles and splice bars	46.00 to 47.00
RR specialties	47.00 to 48.00
Cupola cast.	48.00 to 49.00
Heavy breakable cast.	38.00 to 39.00
Cast iron brake shoes	38.00 to 39.00
Stove plate	42.00 to 43.00
Cast iron car wheels	40.00 to 41.00
Re-rolling rails	60.00 to 61.00
Unstripped motor blocks	39.00 to 40.00

### Birmingham

No. 1 hvy. melting	\$35.00 to \$36.00
No. 2 hvy. melting	30.00 to 31.00
No. 1 dealer bundles	35.00 to 36.00
No. 2 bundles	23.00 to 24.00
No. 1 busheling	35.00 to 36.00
Machine shop turn.	24.00 to 25.00
Shoveling turnings	25.00 to 26.00
Cast iron borings	12.00 to 13.00
Electric furnace bundles	39.00 to 40.00
Elec. furnace, 3 ft & under	37.00 to 38.00
Bar crops and plate	45.00 to 46.00
Structural and plate, 2 ft.	44.00 to 45.00
No. 1 RR hvy. melting	39.00 to 40.00
Scrap rails, random lgth.	47.00 to 48.00
Rails, 18 in. and under	51.00 to 52.00
Angles & Splice bars	47.00 to 48.00
Re-rolling rails	59.00 to 60.00
No. 1 cupola cast.	52.00 to 54.00
Stove plate	53.00 to 54.00
Cast iron car wheels	40.00 to 41.00
Unstripped motor blocks	42.00 to 43.00

## New York

Brokers buying prices per gross ton on cars:	
No. 1 hvy. melting	\$33.00 to \$34.00
No. 2 hvy. melting	29.00 to 30.00
No. 2 dealer bundles	19.00 to 20.00
Mixed bor. and turn.	12.00 to 13.00
Shoveling turnings	13.00 to 14.00
Clean cast. chem. borings	24.00 to 25.00
No. 1 machinery cast.	37.00 to 38.00
Mixed yard cast.	35.00 to 36.00
Heavy breakable cast.	34.00 to 35.00
Stainless	
18-8 prepared solids	180.00 to 185.00
18-8 turnings	80.00 to 85.00
430 prepared solids	70.00 to 75.00

## Detroit

Brokers buying prices per gross ton on cars:	
No. 1 hvy. melting	\$34.00 to \$35.00
No. 2 hvy. melting	24.00 to 25.00
No. 1 dealer bundles	36.00 to 37.00
No. 2 bundles	21.00 to 22.00
No. 1 busheling	34.00 to 35.00
Drop forge flashings	23.00 to 24.00
Machine shop turn.	13.00 to 14.00
Mixed bor. and turn.	14.00 to 15.00
Shoveling turnings	15.00 to 16.00
Cast iron borings	15.00 to 16.00
Heavy breakable cast.	30.00 to 31.00
Mixed cupola cast.	38.00 to 39.00
Automotive cast.	43.00 to 44.00
Stainless	
18-8 bundles and solids	200.00 to 205.00
18-8 turnings	95.00 to 100.00
430 bundles and solids	105.00 to 110.00

## Boston

Brokers buying prices per gross ton on cars:	
No. 1 hvy. melting	\$28.00 to \$29.00
No. 2 hvy. melting	22.00 to 23.00
No. 1 dealer bundles	28.00 to 29.00
No. 2 bundles	17.00 to 18.00
No. 1 busheling	28.00 to 29.00
Machine shop turn.	9.00 to 10.00
Shoveling turnings	12.00 to 13.00
Clean cast. chem. borings	19.00 to 20.00
No. 1 machinery cast.	32.00 to 33.00
Mixed cupola cast.	32.00 to 33.00
Heavy breakable cast.	30.00 to 31.00
Stove plate	21.00 to 22.00

## San Francisco

No. 1 hvy. melting	\$32.00
No. 2 hvy. melting	30.00
No. 1 dealer bundles	28.00
No. 2 bundles	22.00
Machine shop turn.	15.00
Cast iron borings	15.00
No. 1 cupola cast.	45.00

## Los Angeles

No. 1 hvy. melting	\$32.00
No. 2 hvy. melting	30.00
No. 1 dealer bundles	\$27.00 to 28.00
No. 2 bundles	17.00
Machine shop turn.	11.00
Shoveling turnings	13.00
Cast iron borings	13.00
Elec. furn 1 ft and under (foundry)	43.00
No. 1 cupola cast.	42.00

## Seattle

No. 1 hvy. melting	\$30.00
No. 2 hvy. melting	28.00
No. 2 bundles	22.00
No. 1 cupola cast.	36.00
Mixed yard cast.	36.00


## Hamilton, Ont.

No. 1 hvy. melting	\$30.00
No. 2 hvy. melting	26.00
No. 1 dealer bundles	30.00
No. 2 bundles	23.00
Mixed steel scrap	25.00
Busheling	30.00
Bush., new fact., prep'd.	30.00
Bush., new fact., unprep'd	24.00
Machine shop turn.	15.00
Short steel turn.	19.00
Mixed bor. and turn.	15.00
Rails, re-rolling	39.00
Cast scrap	\$39.00 to 41.00

## Houston

Brokers buying prices per gross ton on cars:	
No. 1 hvy. melting	\$38.00
No. 2 hvy. melting	33.00
No. 2 bundles	24.00
Machine shop turn.	17.00
Shoveling turnings	21.00
Cut structural plate 2 ft & under	\$43.00 to 44.00
Unstripped motor blocks	35.00 to 36.00
Cupola cast.	45.00 to 46.00
Heavy breakable cast.	30.00 to 31.00





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# Russia Breaks Tin Prices

**Reds knock down prices in London and New York by dumping tactics.**

**Move may have broken International Tin Council setup for stabilizing tin prices.**

■ Last week Russia indicated her program of economic warfare against the Free World is no idle threat. And she demonstrated just how shrewdly and effectively she can wage a "peaceful" war.

Her target was tin. In a single day she drove both the London and New York markets, two of the world's largest, scrambling for cover. New York prices skidded about 9¢ per lb. London fell about 11¢.

**Big Break**—One "old timer" in New York tin trading said it was the largest single break he could remember.

Both markets are recovering slowly but surely. But in the process of undermining the markets Russia may have broken the International Tin Council. Without its support of prices, New York traders expect the price to settle around 80-85¢ per lb. Tin has been fluctuating at about 95¢.

**More to Come?**—Also, traders both here and abroad warn that Russia can stage a repeat performance, almost at her own convenience.

New York traders say some fence-sitting customers moved quickly to pick up metal at bargain basement prices. But as the market recovers they are expected to climb back on the fence. Many

market observers feel this collapse may have serious long-term implications. Many inventories that were becoming depleted are now back in good enough shape to keep their owners off the market for some time.

**How Reds Did It**—Here's how the Russians did it:

Operating under a restriction of being permitted to sell only 750 long tons per quarter in British markets, they adopted a rifle approach, putting the metal where it would do the most harm.

Early last week they dumped metal into London at the price at which the buffer stock manager must support the market. He had to buy fairly heavily to hold the price up. By the end of the week the buffer stock manager was broke.

**Defense Crumbled**—Russia then offered enough tin at substantially lower prices to topple the market. Without the buffer stock to pick up excess tonnages, there was just no defense.

No Russian tin hit the New York market. But there is usually a spread between New York and London amounting to about the cost of shipping the metal from one place to the other. New York traders had no choice but to meet the London competition.

**Reds Pull Out** — The next day there was little or no sign of Russian tin on the London market. Prices on both sides of the Atlantic started to make small recoveries. Trader opinion was that Russia had retired, having accomplished

just what she intended, and was holding her tin for the next round. It may be even easier then.

The International Tin Council is jammed with tin, and strapped for cash. The group was set up to stabilize tin prices by buying surpluses that tended to drive the price down, and selling from this stock when the price rose too high.

## Lead-Zinc Imports

The Administration is clamping a quota on imports of lead and zinc. The restriction is expected to cut shipments to this country by 20 pct a year.

Under the quota program, imports of the two metals will be limited to 80 pct of "average annual commercial imports" during the five years 1953-57.

**Administration View** — The quota, far below the restriction requested by the producers, "should be of real benefit to the lead and zinc industry," says Interior Secretary Fred A. Seaton.

Higher tariffs on lead and zinc, asked by the industry, were ruled out by the Administration.

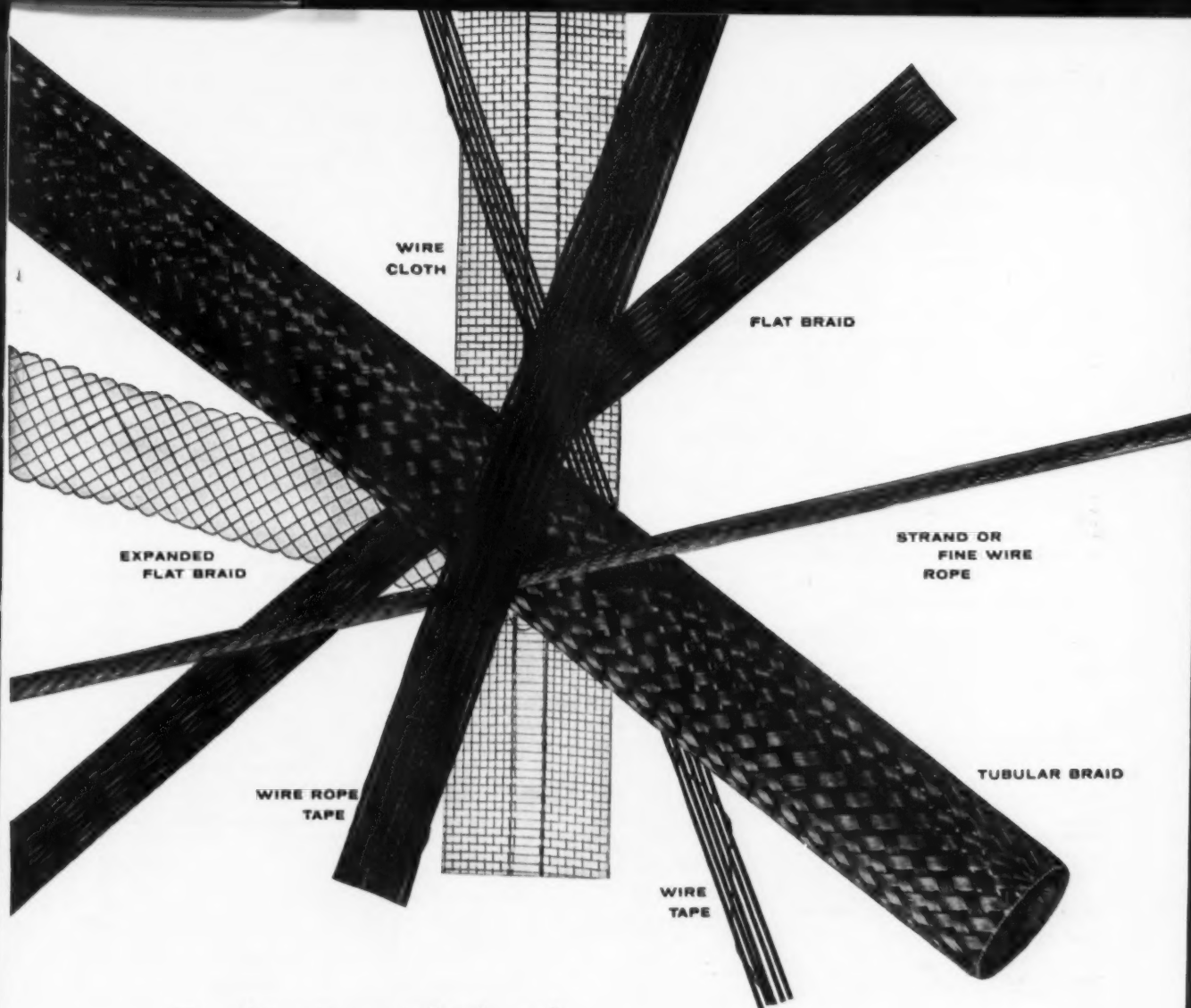
Tin prices for the week: Sept. 17—95.375; Sept. 18—86.50; Sept. 19—91.25; Sept. 22—92.375; Sept. 23—92.375\*.

\* Estimate.

## Primary Prices

(cents per lb)	current price	last price	date of change
Aluminum pig	24.70	24.00	8/1/58
Aluminum ingot	28.00	26.10	8/1/58
Copper (E)	28.00	28-28.00	7/17/58
Copper (CS)	26.25	26.00	9/4/58
Copper (L)	28.00	28.00	7/17/58
Lead, St. L.	10.00	10.55	9/10/58
Lead, N. Y.	11.00	10.75	9/10/58
Magnesium ingot	30.00	34.00	8/13/58
Magnesium pig	30.25	33.75	8/13/58
Nickel	74.00	84.00	12/8/58
Titanium sponge	180-200	200-280	4/1/58
Zinc, E. St. L.	10.00	10.50	7/1/57
Zinc, N. Y.	10.00	11.00	7/1/57

**ALUMINUM:** 99% ingot frt allwd. **COPPER:** (E) = electrolytic, (CS) = custom smelters, electrolytic. (L) = lake. **LEAD:** common grade. **MAGNESIUM:** 99.8% pig Volasco, Tex. **NICKEL:** Port Colbourne, Canada. **ZINC:** prime western. **TIN:** see above; other primary prices, pg. 148.



*Familiarity might breed*

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These materials are used in numerous products today for many different reasons... for strengthening, stiffening, protection, safety, decoration,

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 WORCESTER WIRE WORKS, Worcester, Mass.; music spring, stainless and plated wires, high and low carbon specialties • REYNOLDS WIRE, Dixon, Ill.; industrial wire cloth  
 WAGNER LITHO MACHINERY, Secaucus, N. J.; metal decorating equipment • ATHENIA STEEL, Clifton, N. J.; flat, high carbon spring steels

# NONFERROUS PRICES

## MILL PRODUCTS

(Cents per lb unless otherwise noted)

### ALUMINUM

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#### Flat Sheet (Mill Finish and Plate)

("P" temper except 6061-0)

Alloy	.003	.081	.136-.249	.350-3
1100, 3003.....	45.7	43.8	43.8	43.3
6062.....	53.1	45.4	45.9	44.0
6061-0.....	50.1	45.7	43.9	44.9

#### Extruded Solid Shapes

Factor	6063 T-5	6063 T-6
6-8.....	42.7-44.2	51.1-54.8
13-14.....	42.7-44.2	52.0-56.8
24-26.....	43.2-44.7	52.8-57.5
36-38.....	46.7-49.3	56.9-60.5

#### Screw Machine Stock—2011-T-3

Size"	3/4	3/4-3/4	3/4-1	1 1/4-1 1/4
Price.....	83.0	81.3	80.7	87.3

#### Roofing Sheet, Corrugated

(Per sheet, 26" wide base, 16,000 lb)

Length"→	72	96	120	144
.019 gage.....	\$1.411	\$1.884	\$2.353	\$2.823
.024 gage.....	1.763	2.349	2.937	3.534

## MAGNESIUM

(F.o.b. shipping Pt., carload frt. allowed)

#### Sheet and Plate

Type→	Gage→	.250	.350	.188	.061	.033
AZ31B Stand, Grade.....		67.9	60.0	77.9	108.1	
AZ31B Spec.....		93.3	95.7	106.7	171.3	
Tread Plate.....		70.6	71.7			
Tooling Plate.....	73.0					

#### Extruded Shapes

Factor→	6-8	12-14	24-26	36-38
Comm. Grade.. (AZ31C).....	69.6	70.7	75.6	89.3
Spec. Grade... (AZ31B).....	84.6	85.7	90.6	104.2

#### Alloy Ingot

AZ91B (Die Casting)..... 37.35 (delivered)  
AZ63A, AZ92A, AZ91C (Sand Casting) 40.75 (Velasco, Tex.)

## NICKEL, MONEL, INCONEL

(Base prices f.o.b. mill)

"A" Nickel Monel	Inconel
Sheet, CR.....	126
Strip, CR.....	124
Rod, bar, HR.....	107
Angles, HR.....	107
Plates, HR.....	120
Seamless tube ..	157
Shot, blocks.....	87

## COPPER, BRASS, BRONZE

(Freight included in 5000 lbs)

	Sheet	Wire	Rod	Tube
Copper.....	49.63	.....	46.88	46.63
Brass, 70/30.....	43.67	44.11	43.61	46.48
Brass, Low.....	48.00	46.57	45.97	46.64
Brass, R L.....	46.80	47.43	46.83	46.70
Brass, Naval.....	47.53	.....	42.14	51.34
Muntz Metal.....	45.95	.....	41.76	.....
Comm. Br.....	48.30	48.54	48.34	50.88
Mang. Br.....	51.67	.....	45.67	.....
Phos Br. 5%.....	55.89	.....	59.00	.....

Free Cutting Brass Rod..... 29.28

## TITANIUM

(Base prices, f.o.b. mill)

Sheet and strip, commercially pure, \$8.50-\$10.10; alloy, \$15.95; Plate, HR, commercially pure, \$6.00-\$6.75; alloy, \$8.75-\$9.60. Wire, rolled and/or drawn, commercially pure, \$6.50-\$7.00; alloy, \$10.00-\$11.50; Bar, HR or forged, commercially pure, \$5.25-\$5.50; alloy, \$5.25-\$6.35; billets, HR, commercially pure, \$4.10-\$4.35; alloy, \$4.10-\$4.20.

## PRIMARY METAL

(Cents per lb unless otherwise noted)

Antimony, American, Laredo, Tex., 29.50  
Beryllium aluminum 5% Be, Dollar per lb contained Be.....\$74.75  
Beryllium copper, per lb cont'd Be.....\$43.00  
Beryllium 97% lump or beads, f.o.b. Cleveland, Reading.....\$71.50  
Bismuth, ton lots.....\$ 2.25  
Cadmium, del'd.....\$ 1.55  
Calcium, 99.9% small lots.....\$ 4.55  
Chromium, 99.8% metallic basis.....\$ 1.31  
Cobalt, 97-99% (per lb).....\$2.00 to \$2.07  
Germanium, per gm, f.o.b. Miami, Okla., refined.....\$39.50 to \$50.00  
Gold, U. S. Treas., per troy oz.....\$35.00  
Indium, 99.9%, dollars per troy oz.....\$ 2.25  
Iridium, dollars per troy oz.....\$70 to \$80  
Lithium, 98%.....\$11.00 to \$14.00  
Magnesium, sticks, 100 to 500 lb.....\$ 59.00  
Mercury, dollars per 76-lb flask, f.o.b. New York.....\$240 to \$244  
Nickel oxide sinter at Buffalo, N. Y., or other U. S. points of entry, contained nickel.....\$ 69.60  
Palladium, dollars per troy oz.....\$15 to \$17  
Platinum, dollars per troy oz.....\$57 to \$60  
Rhodium.....\$120.00 to \$125.00  
Silver ingots (¢ per troy oz.).....\$8.625  
Thorium, per kg.....\$43.00  
Vanadium.....\$ 3.45  
Zirconium sponge.....\$ 5.00

## REMELTED METALS

### Brass Ingot

(Cents per lb delivered, carloads)

85-5-5 ingot..... 27.00  
No. 115..... 26.25  
No. 120..... 26.25  
No. 123..... 25.75  
80-10-10 ingot..... 31.25  
No. 305..... 29.25  
No. 315..... 38.25  
88-10-2 ingot..... 34.00  
No. 210..... 30.75  
No. 215..... 30.75  
No. 245..... 22.75  
Yellow ingot..... 22.75  
No. 405..... 24.50  
Manganese bronze..... 24.50  
No. 421..... 24.50

### Aluminum Ingot

(Cents per lb del'd 30,000 lb and over)

95-5 aluminum-silicon alloys..... 24.75-25.00  
0.30 copper max..... 24.50-24.75  
0.60 copper max..... 24.50-24.75  
Piston alloys (No. 122 type)..... 24.25-25.25  
No. 12 alum. (No. 2 grade)..... 21.50-22.00  
108 alloy..... 22.00-22.50  
195 alloy..... 25.00-26.00  
12 alloy (0.60 copper max.)..... 24.25-24.75  
AXS-679 (1 pct zinc)..... 21.75-22.25

(Effective Sept. 22, 1958)

## Steel deoxidizing aluminum notch bar granulated or shot

Grade 1—95-97 1/2%..... 22.50-23.50  
Grade 2—92-95%..... 21.25-22.25  
Grade 3—90-92%..... 20.25-21.25  
Grade 4—85-90%..... 17.50-18.50

## SCRAP METALS

### Brass Mill Scrap

(Cents per pound, add 1¢ per lb for shipments of 20,000 lb and over)

	Heavy	Turnings
Copper.....	22 1/2	21 1/2
Yellow brass.....	17	15 1/2
Red brass.....	19 1/2	19
Comm. bronze.....	20 1/2	19 1/2
Mang. bronze.....	15 1/2	14 1/2
Yellow brass rod ends	16 1/2	

### Customs Smelters Scrap

(Cents per pound carload lots, delivered to refinery)

No. 1 copper wire..... 22 1/2  
No. 2 copper wire..... 21  
Light copper..... 18 1/2  
Light copper..... 18 1/2  
Copper bearing material..... 18 1/2  
Dry copper content..... 18 1/2

### Ingot Makers Scrap

(Cents per pound carload lots, delivered to refinery)

No. 1 copper wire..... 22 1/2  
No. 2 copper wire..... 21  
Light copper..... 18 1/2  
No. 1 composition..... 18 1/2  
No. 1 comp. turnings..... 13 1/2  
Hvy. yellow brass solids..... 15  
Brass pipe..... 15  
Radiators..... 15  
Mixed old cast..... 12 — 12 1/2  
Mixed new clips..... 15 — 16  
Mixed turnings, dry..... 13 — 14

### Dealers' Scrap

(Dealers' buying price f.o.b. New York in cents per pound)

**Copper and Brass**  
No. 1 copper wire..... 19 1/2 — 20  
No. 2 copper wire..... 17 1/2 — 18  
Light copper..... 15 1/2 — 16  
Auto radiators (unsweated)..... 11 1/2 — 12  
No. 1 composition..... 15 1/2 — 16  
No. 1 composition turnings..... 14 1/2 — 15  
Cocks and faucets..... 12 1/2 — 13  
Clean heavy yellow brass..... 10 1/2 — 11 1/2  
Brass pipe..... 12 1/2 — 13 1/2  
New soft brass clippings..... 13 1/2 — 14 1/2  
No. 1 brass rod turnings..... 10 1/2 — 11 1/2

### Aluminum

Alum. pistons and struts..... 5 1/2 — 6 1/2  
Aluminum crankcases..... 9 1/2 — 9 1/2  
1100 (2S) aluminum clippings..... 12 1/2 — 13 1/2  
Old sheet and utensils..... 9 1/2 — 9 1/2  
Borings and turnings..... 6 1/2 — 6 1/2  
Industrial castings..... 9 1/2 — 9 1/2  
2024 (24S) clippings..... 10 1/2 — 11 1/2

### Zinc

New zinc clippings..... 4 — 4 1/2  
Old zinc..... 3 — 3 1/2  
Zinc routings..... 1 1/2 — 2  
Old die cast scrap..... 1 1/2 — 1 1/2

### Nickel and Monel

Pure nickel clippings..... 52-54  
Clean nickel turnings..... 37-40  
Nickel anodes..... 52-54  
Nickel rod ends..... 52-54  
New Monel clippings..... 30-32  
Clean Monel turnings..... 30-32  
Old sheet Monel..... 26-28  
Nickel silver clippings, mixed..... 18  
Nickel silver turnings, mixed..... 15

### Lead

Soft scrap lead..... 6 1/2 — 6 1/2  
Battery plates (dry)..... 2 — 2 1/2  
Batteries, acid free..... 1 1/2 — 1 1/2

### Miscellaneous

Block tin..... 75 — 76  
No. 1 pewter..... 59 — 60  
Auto babbitt..... 39 — 40  
Mixer common babbitt..... 9 1/2 — 10  
Solder joints..... 13 1/2 — 13 1/2  
Siphon tops..... 42  
Small foundry type..... 10 1/2 — 10 1/2  
Monotype..... 10 1/2 — 10 1/2  
Lino. and stereotype..... 9 1/2 — 9 1/2  
Electrotype..... 8 1/2 — 8 1/2  
Hand picked type shells..... 6 1/2 — 6 1/2  
Lino. and stereo. dross..... 2 1/2 — 2 1/2  
Electro dross..... 1 1/2 — 2



## IRON AGE

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

STEEL  
PRICESBILLETS, BLOOMS,  
SLABSPIL-  
INGSHAPES  
STRUCTURALS

## STRIP

Carbon  
Re-rolling  
Net TonCarbon  
Forging  
Net TonAlloy  
Net TonSheet  
Steel

Carbon

Hi Str.  
Low  
AlloyCarbon  
Wide  
FlangeHot-  
rolledCold-  
rolledHi Str.  
H.R. Low  
AlloyHi Str.  
C.R. Low  
AlloyAlloy  
Hot-  
rolledAlloy  
Cold-  
rolled

EAST

Bethlehem, Pa.

Buffalo, N. Y.

Phila., Pa.

Harrison, N. J.

Conshohocken, Pa.

New Bedford, Mass.

Johnstown, Pa.

Boston, Mass.

New Haven, Conn.

Baltimore, Md.

Phoenixville, Pa.

Sparrows Pt., Md.

New Britain,  
Bridgeport,  
Wallingford, Conn.Pawtucket, R. I.  
Worcester, Mass.

Alton, Ill.

Ashland, Ky.

Canton-Massillon,  
Dover, OhioChicago, Ill.  
Franklin Park, Ill.  
Evanston, Ill.

Cleveland, Ohio

Detroit, Mich.

Anderson, Ind.

Gary, Ind. Harbor,  
Indiana

Sterling, Ill.

Indianapolis, Ind.

Newport, Ky.

Niles, Warren, Ohio  
Sharon, Pa.

Owensboro, Ky.

Pittsburgh, Pa.  
Midland, Pa.  
Butler, Pa.  
Aliquippa, Pa.Weirton, Wheeling,  
Follansbee, W. Va.

Youngstown, Ohio

Fontana, Cal.

Geneva, Utah

Kansas City, Mo.

Los Angeles,  
Torrance, Cal.

Minneapolis, Colo.

Portland, Ore.

San Francisco, Niles,  
Pittsburg, Cal.

Seattle, Wash.

Atlanta, Ga.

Fairfield, Ala. City,  
Birmingham, Ala.Houston, Lone Star,  
Texas

SOUTH

\$119.00 B3

\$80.00 R3,  
B3\$99.50 R3,  
B3\$119.00 R3,  
B3

6.50 B3

5.55 B3

8.10 B3

5.55 B3

5.10 B3,  
R37.425 S10,  
R2

7.575 B3

7.875 P15

15.55 C11

\$104.50 A2

\$126.00 A2

5.15 A2

7.575 A2

7.875 R6

\$80.00 B3

\$99.50 B3

\$119.00 B3

5.55 B3

8.10 B3

7.975 T8

7.875 D1

7.425 T8

15.90 T8

5.55 P2

5.55 P2

5.10 B3

7.575 B3

7.875 W1,S7

\$119.00 N8

7.975 N7,  
A515.90 N7  
15.70 T8

5.30 L1

5.10 A7

7.575 A7

7.425 G4

10.80 G4

15.50 C11

\$102.00 R3

\$119.00 R3,  
\$114.00 T3

7.425 G4

\$80.00 U1,  
R3\$99.50 U1,  
R3,W8\$119.00 U1,  
R3,W8

6.50 U1

5.50 U1,  
W8,P138.05 U1,  
Y1,W8

5.50 U1

5.10 W8,  
N4,A17.525 A1,T8,  
M8

7.575 W8

8.40 W8,  
S9,I315.55 A1,  
S9,G4,T8

7.425 A5,J3

10.75 A5

8.40 J3

\$119.00 R5

5.10 G3,  
M27.425 M2,  
D1,D2,P11

7.575 G3

10.80 I12

7.425 G4

\$80.00 U1

\$99.50 U1

\$119.00 U1,  
Y15.50 U1,  
I38.05 U1,  
J3

5.50 I3

5.10 U1,  
I3,Y1

7.425 Y1

7.575 U1,  
I3,Y1

10.80 Y1

8.40 U1,  
Y1

5.20 N4

7.575 R5

15.70 R5

5.10 A9

8.40 A9

## IRON AGE

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

STEEL  
PRICES

STEEL PRICES		SHEETS							WIRE ROD	TINPLATE†		BLACK PLATE	
		Hot-rolled 18 ga. & hvyr.	Cold-rolled	Galvanized (Hot-dipped)	Enamel- ing	Long Terne	Hi Str. Low Alloy H.R.	Hi Str. Low Alloy C.R.		Hi Str. Low Alloy Galv.	Cokes* 1.25-lb. base box		Electro* 0.25-lb. base box
EAST	Buffalo, N. Y.	5.10 B3	6.275 B3				7.525 B3	9.275 B3		6.40 W6	† Special coated mig. terne deduct 50¢ from 1.25-lb. coke base box price. Can-making quality blackplate 55 to 125 lb. deduct \$2.20 from 1.25 lb. coke base box. * COKES: 1.50-lb. add 25¢. ELECTRO: 0.50-lb. add 25¢; 0.75-lb. add 65¢; 1.00-lb. add \$1.00. Differ- ential 1.00 lb. 0.25 lb. add 65¢.		
	Claymont, Del.												
	Coatesville, Pa.												
	Conschocken, Pa.	5.15 A2	6.325 A2				7.575 A2						
	Harrisburg, Pa.												
	Hartford, Conn.												
	Johnstown, Pa.								6.40 B3				
	Fairless, Pa.	5.15 U1	6.325 U1				7.575 U1	9.775 U1			\$10.15 U1	\$8.85 U1	
	New Haven, Conn.												
	Phoenixville, Pa.												
Sparrows Pt., Md.	5.10 B3	6.275 B3	6.875 B3			7.525 B3	9.275 B3	10.025 B3	6.50 B3	\$10.15 B3	\$8.85 B3		
Worcester, Mass.									6.70 A5				
Trenton, N. J.													
MIDDLE WEST	Alton, Ill.									6.60 L1			
	Ashland, Ky.	5.10 A7		6.875 A7	6.775 A7		7.525 A7						
	Canton-Massillon, Dover, Ohio			6.875 R1, R3									
	Chicago, Joliet, Ill.	5.10 W8, A1					7.525 U1, W8			6.40 A5, R3, W8			
	Sterling, Ill.									6.50 N4, K2			
	Cleveland, Ohio	5.10 R3, J3	6.275 R3, J3	7.65 R3*	6.775 R3		7.525 R3, J3	9.275 R3, J3		6.40 A5			
	Detroit, Mich.	5.10 G3, M2	6.275 G3, M2				7.525 G3	9.275 G3					
	Newport, Ky.	5.10 A1	6.275 A1										
	Gary, Ind. Harbor, Indiana	5.10 U1, I3, Y1	6.275 U1, I3, Y1	6.875 U1, I3	6.775 U1, I3, Y1	7.225 U1	7.525 U1, Y1, I3	9.275 U1, Y1		6.40 Y1	\$10.05 U1, Y1	\$8.75 I3, U1, Y1	7.50 U1, Y1
	Granite City, Ill.	5.20 G2	6.375 G2	6.975 G2	6.875 G2							\$8.85 G2	7.60 G2
	Kokomo, Ind.			6.975 C9						6.50 C9			
	Mansfield, Ohio	5.10 E2	6.275 E2			7.225 E2							
	Middletown, Ohio		6.275 A7	6.875 A7	6.775 A7	7.225 A7							
	Niles, Warren, Ohio Sharon, Pa.	5.10 R3, N3, S1	6.275 R3	6.875 R3 7.65 R3*	6.775 N3, S1	7.225 N3, S1*, R3	7.525 R3, S1	9.275 S1, R3				\$8.75 R3	
Pittsburgh, Pa. Midland, Pa. Butler, Pa. Donora, Pa. Aliquippa, Pa.	5.10 U1, J3, P6	6.275 U1, J3, P6	6.875 U1, J3	6.775 U1		7.525 U1, J3	9.275 U1, J3	10.025 U1, J3	6.40 A5, J3, P6	\$10.05 W5, J3	\$8.75 U1, J3	7.50 U1, J3	
WEST	Portsmouth, Ohio	5.10 P7	6.275 P7							6.40 P7			
	Weirton, Wheeling, Follansbee, W. Va.	5.10 W3, W5	6.275 W3, F3, W5	6.875 W3, W5 7.50 W3*		7.225 W3, W5	7.525 W3	9.275 W3			\$10.05 W5, W3	\$8.75 W5, W3	7.50 W5
	Youngstown, Ohio	5.10 U1, Y1	6.275 Y1	7.50 J3*	6.775 Y1		7.525 Y1	9.275 Y1		6.40 Y1			
	Fontana, Cal.	5.85 K1	7.525 K1				8.275 K1	10.575 K1			\$10.80 K1	\$9.50 K1	
	Geneva, Utah	5.20 C7											
	Kansas City, Mo.									6.65 S2			
	Los Angeles, Torrance, Cal.									7.20 B2			
SOUTH	Minnequa, Colo.									6.65 C6			
	San Francisco, Niles, Pittsburg, Cal.	5.00 C7	7.225 C7	7.625 C7						7.20 C7	\$10.80 C7	\$9.50 C7	
	Atlanta, Ga.												
	Fairfield, Ala. Alabama City, Ala.	5.10 T2, R3	6.275 T2, R3	6.875 T2, R3	6.775 T2					6.40 T2, R3	\$10.15 T2	\$8.85 T2	
Houston, Texas										6.65 S2			

\* Electrogalvanized sheets.

(Effective Sept. 22, 1958)

\*7.425 at Sharon-Niles in 7.225

## IRON AGE

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

STEEL  
PRICES

		BARS						PLATES			WIRE	
		Carbon† Steel	Reinforc- ing	Cold Finished	Alloy Hot- rolled	Alloy Cold Drawn	Hi Str. H.R. Low Alloy	Carbon Steel	Floor Plate	Alloy	Hi Str. Low Alloy	Mfr's. Bright
EAST	Bethlehem, Pa.				6.725 B3	9.025 B3	8.30 B3					
	Buffalo, N. Y.	5.675 R3,B3	5.675 R3,B3	7.70 B5	6.725 B3,R3	9.025 B3,B5	8.30 B3	5.30 B3				8.00 W6
	Claymont, Del.							5.30 C4		7.50 C4	7.95 C4	
	Cotescville, Pa.							5.30 L4		7.50 L4	7.95 L4	
	Conshohocken, Pa.							5.30 A2	6.375 A2	7.50 A2	7.95 A2	
	Harrisburg, Pa.							5.30 P2	6.475 P2			
	Milton, Pa.	5.825 M7	5.825 M7									
	Hartford, Conn.			8.15 R3		9.325 R3						
	Johnstown, Pa.	5.675 B3	5.675 B3		6.725 B3		8.30 B3	5.30 B3		7.50 B3	7.95 B3	8.00 B3
	Fairless, Pa.	5.825 U1	5.825 U1		6.875 U1							
	Newark, N. J.			8.10 W10, P10		9.20 W10, P10						
	Camden, N. J.											
	Bridgeport, Putnam, Willamantic, Conn.			8.20 W10 8.15 J3	6.80 N8	9.175 N8						
	Sparrows Pt., Md.		5.675 B3					5.30 B3		7.50 B3	7.95 B3	8.10 B3
MIDDLE WEST	Palmer, Worcester, Roadville, Mass. Mansfield, Mass.			8.20 B5, C14		9.325 A5,B5						8.30 A5, W6
	Spring City, Pa.			8.10 K4		9.20 K4						
	Alton, Ill.	5.875 L1										8.20 L1
	Ashland, Newport, Ky.							5.30 A7,A9		7.50 A9	7.95 A7	
	Canton, Massillon, Mansfield, Ohio	6.15* R3		7.65 R3,R2	6.725 R3 6.475 T5	9.025 R3,R2 8.775 T5		5.30 E2				
	Chicago, Joliet, Waukegan, Ill. Harvey, Ill.	5.675 U1,R3, W8,N4,P13	5.675 U1,R3, N4,P13,W8	7.65 A5, W10,W8, B5,L2,N9	6.725 U1,R3, W8	9.025 A5, W10,W8, L2,N8,B5	8.30 U1,W8, R3	5.30 U1,A1, W8,I3	6.375 U1	7.50 U1, W8	7.95 U1, W8	8.00 A5,R3, W8,N4, K2,W7
	Cleveland, Ohio Elyria, Ohio	5.675 R3	5.675 R3	7.65 A5,C13, C18		9.025 A5, C13,C18	8.30 R3	5.30 R3,J3	6.375 J3		7.95 R3,J3	8.00 A5, C13,C18
	Detroit, Mich.	5.675 G3	5.675 G3	7.90 P3 7.85 P8,B5 7.65 R5	6.725 R5,G3	9.025 R5 9.225 B5,P3, P8	8.30 G3	5.30 G3		7.50 G3	7.95 G3	
	Duluth, Minn.											8.00 A5
	Gary, Ind. Harbor, Crawfordsville, Hammond, Ind.	5.675 U1,I3, Y1	5.675 U1,I3, Y1	7.65 R3,J3	6.725 U1,I3, Y1	9.025 R3,M4	8.30 U1,Y1	5.30 U1,I3, Y1	6.375 J3, I1	7.50 U1, Y1	7.95 U1, Y1,I3	8.10 M4
	Granite City, Ill.							5.40 G2				
	Kokomo, Ind.		5.775 C9									8.10 C9
	Sterling, Ill.	5.775 N4	5.775 N4					5.30 N4				8.10 K2
	Niles, Warren, Ohio Sharon, Pa.			7.65 C10	6.725 C10,S1	9.025 C10	7.925 S1	5.30 R3,S1		7.50 S1	7.95 R3, S1	
	Owensboro, Ky.	5.675 G5			6.725 G5							
	Pittsburgh, Midland, Donora, Aliquippa, Pa.	5.675 U1,J3	5.675 U1,J3	7.65 A5,B6, R3,J3,C11, W10,S9,C8, M9	6.725 U1,J3, C11,B7	9.025 A5, W10,R3,S9, C11,C8,M9	8.30 U1,J3	5.30 U1,J3	6.375 U1	7.50 U1, J3,B7	7.95 U1, J3,B7	8.00 A5, J3,P6
	Portsmouth, Ohio											8.00 P7
	Weirton, Wheeling, Follansbee, W. Va.							5.30 W5				
	Youngstown, Ohio	5.675 U1,R3, Y1	5.675 U1,R3, Y1	7.65 A1,Y1, F2	6.725 U1,Y1	9.025 Y1,F2	8.30 U1,Y1	5.30 U1, R3,Y1		7.50 Y1	7.95 U1,Y1	8.00 Y1
WEST	Emeryville, Cal.	6.425 J5 6.375 K1	6.425 J5 6.375 K1		7.775 K1		8.625 K1	6.10 K1		8.30 K1	8.75 K1	
	Fontana, Cal.											
	Geneva, Utah							5.30 C7			7.95 C7	
	Kansas City, Mo.	5.925 S2	5.925 S2		6.975 S2		8.55 S2					8.25 S2
	Los Angeles, Torrance, Cal.	6.375 C7,B2	6.375 C7,B2	9.10 R3,P14, S12	7.775 B2	11.00 P14, S12	8.625 B2					8.95 B2
	Minnequa, Colo.	6.125 C6	6.125 C6					6.15 C6				8.25 C6
	Portland, Ore.	6.425 O2	6.425 O2									
	San Francisco, Niles, Pittsburg, Cal.	6.375 C7 6.425 B2	6.375 C7 6.425 B2				8.675 B2					8.95 C7,C6
	Seattle, Wash.	6.425 B2,N6	6.425 B2				8.675 B2	6.20 B2		8.40 B2	8.85 B2	
	Atlanta, Ga.	5.875 A8	5.875 A8									8.00 A8
SOUTH	Fairfield, Ala. City, Birmingham, Ala.	5.675 T2,R3, C16	5.675 T2,R3, C16	8.25 C76			8.30 T2	5.30 T2,R3			7.95 T2	8.00 T2,R3
	Houston, Ft. Worth, Lone Star, Texas	5.925 S2	5.925 S2		6.975 S2		8.55 S2	5.40 S2		7.60 S2	8.05 S2	8.25 S2

† Merchant Quality—Special Quality 35¢ higher.

(Effective Sept. 22, 1958)

\* Special Quality.

# STEEL PRICES

## Key to Steel Producers

### With Principal Offices

- A1 Acme Steel Co., Chicago  
A2 Alan Wood Steel Co., Conshohocken, Pa.  
A3 Allegheny Ludlum Steel Corp., Pittsburgh  
A4 American Clad Metals Co., Carnegie, Pa.  
A5 American Steel & Wire Div., Cleveland  
A6 Angel Nail & Chaplet Co., Cleveland  
A7 Armco Steel Corp., Middletown, Ohio  
A8 Atlantic Steel Co., Atlanta, Ga.  
A9 Acme-Newport Steel Co., Newport, Ky.  
B1 Babcock & Wilcox Tube Div., Beaver Falls, Pa.  
B2 Bethlehem Pacific Coast Steel Corp., San Francisco  
B3 Bethlehem Steel Co., Bethlehem, Pa.  
B4 Blair Strip Steel Co., New Castle, Pa.  
B5 Bliss & Laughlin, Inc., Harvey, Ill.  
B6 Brook Plant, Wickwire-Spencer Steel Div., Birdsboro, Pa.  
B7 A. M. Byers, Pittsburgh  
B8 Braeburn Alloy Steel Corp., Braeburn, Pa.  
C1 Calstrip Steel Corp., Los Angeles  
C2 Carpenter Steel Co., Reading, Pa.  
C4 Claymont Products Dept., Claymont, Del.  
C6 Colorado Fuel & Iron Corp., Denver  
C7 Columbia Geneva Steel Div., San Francisco  
C8 Columbia Steel & Shifting Co., Pittsburgh  
C9 Continental Steel Corp., Kokomo, Ind.  
C10 Copperweld Steel Co., Pittsburgh, Pa.  
C11 Crucible Steel Co. of America, Pittsburgh  
C13 Cuyahoga Steel & Wire Co., Cleveland  
C14 Compressed Steel Shifting Co., Readville, Mass.  
C15 G. O. Carlson, Inc., Thorndale, Pa.  
C16 Connors Steel Div., Birmingham  
C18 Cold Drawn Steel Plant, Western Automatic Machine Screw Co., Elyria, O.  
D1 Detroit Steel Corp., Detroit  
D2 Dearborn Div., Sharon Steel Corp.  
D3 Driver Harris Co., Harrison, N. J.  
D4 Dickson Weatherproof Nail Co., Evanston, Ill.  
E1 Eastern Stainless Steel Corp., Baltimore  
E2 Empire-Reeves Steel Corp., Mansfield, O.  
F1 Firth Sterling, Inc., McKeesport, Pa.  
F2 Fitzsimons Steel Corp., Youngstown  
F3 Follansbee Steel Corp., Follansbee, W. Va.

- G2 Granite City Steel Co., Granite City, Ill.  
G3 Great Lakes Steel Corp., Detroit  
G4 Greer Steel Co., Dover, O.  
G5 Green River Steel Corp., Owenboro, Ky.  
H1 Hanna Furnace Corp., Detroit  
I2 Ingersoll Steel Div., Chicago  
I3 Inland Steel Co., Chicago  
I4 Interlake Iron Corp., Cleveland  
J1 Jackson Iron & Steel Co., Jackson, O.  
J2 Jessop Steel Corp., Washington, Pa.  
J3 Jones & Laughlin Steel Corp., Pittsburgh  
J4 Joslyn Mfg. & Supply Co., Chicago  
J5 Judson Steel Corp., Emeryville, Calif.  
K1 Kaiser Steel Corp., Fontana, Calif.  
K2 Keystone Steel & Wire Co., Peoria  
K3 Koppers Co., Granite City, Ill.  
K4 Keystone Drawn Steel Co., Spring City, Pa.  
L1 Laclede Steel Co., St. Louis  
L2 La Salle Steel Co., Chicago  
L3 Lone Star Steel Co., Dallas  
L4 Lukens Steel Co., Coatesville, Pa.  
M1 Mahoning Valley Steel Co., Niles, O.  
M2 McLouth Steel Corp., Detroit  
M3 Mercer Tube & Mfg. Co., Sharon, Pa.  
M4 Mid States Steel & Wire Co., Crawfordsville, Ind.  
M6 Mystic Iron Works, Everett, Mass.  
M7 Milton Steel Products Div., Milton, Pa.  
M8 Mill Strip Products Co., Evanston, Ill.  
M9 Moltrup Steel Products Co., Beaver Falls, Pa.  
N1 National Supply Co., Pittsburgh  
N2 National Tube Div., Pittsburgh  
N3 Niles Rolling Mill Div., Niles, O.  
N4 Northwestern Steel & Wire Co., Sterling, Ill.  
N6 Northwest Steel Rolling Mills, Seattle  
N7 Newman Crosby Steel Co., Pawtucket, R. I.  
N8 Carpenter Steel of New England, Inc., Bridgeport, Conn.  
N9 Nelson Steel & Wire Co.  
O1 Oliver Iron & Steel Co., Pittsburgh  
O2 Oregon Steel Mills, Portland  
P1 Page Steel & Wire Div., Monessen, Pa.  
P2 Phoenix Iron & Steel Co., Phoenixville, Pa.  
P3 Pilgrim Drawn Steel Div., Plymouth, Mich.  
P4 Pittsburgh Coke & Chemical Co., Pittsburgh  
P5 Pittsburgh Screw & Bolt Co., Pittsburgh  
P6 Pittsburgh Steel Co., Pittsburgh  
P7 Portsmouth Div., Detroit Steel Corp., Detroit  
P8 Plymouth Steel Co., Detroit  
P9 Pacific States Steel Co., Niles, Cal.  
P10 Precision Drawn Steel Co., Camden, N. J.  
P11 Production Steel Strip Corp., Detroit  
P13 Phoenix Mfg. Co., Joliet, Ill.  
P14 Pacific Tube Co.  
P15 Philadelphia Steel and Wire Corp.  
R2 Reliance Div., Eaton Mfg. Co., Massillon, O.  
R3 Republic Steel Corp., Cleveland  
R4 Roebbing Sons Co., John A., Trenton, N. J.  
R5 Jones & Laughlin Steel Corp., Stainless and Strip Div.  
R6 Rodney Metals, Inc., New Bedford, Mass.  
R7 Rome Strip Steel Co., Rome, N. Y.  
S1 Sharon Steel Corp., Sharon, Pa.  
S2 Sheffield Steel Div., Kansas City  
S3 Shenango Furnace Co., Pittsburgh  
S4 Simonds Saw and Steel Co., Fitchburg, Mass.  
S5 Sweet's Steel Co., Williamsport, Pa.  
S7 Stanley Works, New Britain, Conn.  
S8 Superior Drawn Steel Co., Monaca, Pa.  
S9 Superior Steel Div. of Copperweld Steel Co., Carnegie, Pa.  
S10 Seneca Steel Service, Buffalo  
S11 Southern Electric Steel Co., Birmingham  
S12 Sierra Drawn Steel Corp., Los Angeles, Calif.  
T1 Tonawanda Iron Div., N. Tonawanda, N. Y.  
T2 Tennessee Coal & Iron Div., Fairfield  
T3 Tennessee Products & Chem. Corp., Nashville  
T4 Thomas Strip Div., Warren, O.  
T5 Timken Steel & Tube Div., Canton, O.  
T7 Texas Steel Co., Fort Worth  
T8 Thompson Wire Co., Boston  
U1 United States Steel Corp., Pittsburgh  
U2 Universal-Cyclops Steel Corp., Bridgeville, Pa.  
U3 Ulbrich Stainless Steels, Wallingford, Conn.  
U4 U. S. Pipe & Foundry Co., Birmingham  
W1 Wallingford Steel Co., Wallingford, Conn.  
W2 Washington Steel Corp., Washington, Pa.  
W3 Weirton Steel Co., Weirton, W. Va.  
W4 Wheatland Tube Co., Wheatland, Pa.  
W5 Wheeling Steel Corp., Wheeling, W. Va.  
W6 Wickwire Spencer Steel Div., Buffalo  
W7 Wilson Steel & Wire Co., Chicago  
W8 Wisconsin Steel Div., S. Chicago, Ill.  
W9 Woodward Iron Co., Woodward, Ala.  
W10 Wyckoff Steel Co., Pittsburgh  
W12 Wallace Barnes Steel Div., Bristol, Conn.  
Y1 Youngstown Sheet & Tube Co., Youngstown, O.

### PIPE AND TUBING

Base discounts (pct) L.S. mills. - Base price about \$200 per net ton.

	BUTTWELD												SEAMLESS											
	1/2 In.		3/4 In.		1 In.		1 1/4 In.		1 1/2 In.		2 In.		2 1/2-3 In.		2 In.		2 1/2 In.		3 In.		3 1/2-4 In.			
	Bk.	Gal.	Bk.	Gal.	Bk.	Gal.	Bk.	Gal.	Bk.	Gal.	Bk.	Gal.	Bk.	Gal.	Bk.	Gal.	Bk.	Gal.	Bk.	Gal.	Bk.	Gal.	Bk.	Gal.
<b>STANDARD T. &amp; C.</b>																								
Sparrows Pt. B3	0.25	*15.0	3.25	*11.0	6.75	*6.50	9.25	*5.75	9.75	*4.75	10.25	*4.25	11.75	*4.50										
Youngtown R3	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50										
Fontana K1	*10.75	*26.00	*7.75	*22.00	*4.25	*17.50	*1.75	*16.75	*1.25	*15.75	*0.75	*15.25	0.75	*15.50										
Pittsburgh J3	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50	*12.25	*27.25	*5.75	*22.50	*3.25	*20.0	*1.75	*18.50		
Alton, Ill. L1	0.25	*15.0	3.25	*11.0	6.75	*6.50	9.25	*5.75	9.75	*4.75	10.25	*4.25	11.75	*4.50										
Sharon M3	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50										
Fairless N2	0.25	*15.0	3.25	*11.0	6.75	*6.50	9.25	*5.75	9.75	*4.75	10.25	*4.25	11.75	*4.50										
Pittsburgh N1	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50	*12.25	*27.25	*5.75	*22.50	*3.25	*20.0	*1.75	*18.50		
Wheeling W5	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50										
Wheatland W4	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50	*12.25	*27.25	*5.75	*22.50	*3.25	*20.0	*1.75	*18.50		
Youngtown Y1	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50										
Indiana Harbor Y1	1.25	*14.0	4.25	*10.0	7.75	*5.50	10.25	*4.75	10.75	*3.75	11.25	*3.25	12.75	*3.50										
Lorain N2	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50	*12.25	*27.25	*5.75	*22.50	*3.25	*20.0	*1.75	*18.50		
<b>EXTRA STRONG PLAIN ENDS</b>																								
Sparrows Pt. B3	4.75	*9.0	8.75	*5.0	11.75	*0.50	12.25	*1.75	12.75	*0.75	13.25	*0.25	13.75	*1.50										
Youngtown R3	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50										
Fairless N2	4.75	*9.0	8.75	*5.0	11.75	*0.50	12.25	*1.75	12.75	*0.75	13.25	*0.25	13.75	*1.50										
Fontana K1	*6.25	*2.25	0.75				1.25		1.75		2.25		2.75											
Pittsburgh J3	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50	*10.75	*24.75	*3.25	*19.0	*0.75	*16.50	4.25	*11.50		
Alton, Ill. L1	4.75	*9.0	8.75	*5.0	11.75	*0.50	12.25	*1.75	12.75	*0.75	13.25	*0.25	13.75	*1.50										
Sharon M3	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50										
Pittsburgh N1	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50	*10.75	*24.75	*3.25	*19.0	*0.75	*16.50	4.25	*11.50		
Wheeling W5	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50										
Wheatland W4	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50										
Youngtown Y1	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50	*10.75	*24.75	*3.25	*19.0	*0.75	*16.50	4.25	*11.50		
Indiana Harbor Y1	5.75	*8.0	9.75	*4.0	12.75	0.50	13.25	*0.75	13.75	0.25	14.25	0.75	14.75	*0.50										
Lorain N2	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50	*10.75	*24.75	*3.25	*19.0	*0.75	*16.50	4.25	*11.50		

Threads only, butt weld and seamless, 2 1/2 pt. higher discount. Plain ends, butt weld and seamless, 2-in. and under, 5 1/2 pt. higher discount.

Galvanized discounts based on zinc price range of over 9¢ to 11¢ per lb. East St. Louis. For each 2¢ change in zinc, discounts vary as follows: 1/2, 3/4 and 1-in., 2 pt.; 1 1/4, 1 1/2 and 2-in., 1 1/2 pt.; 2 1/2 and 3-in., 1 pt., e.g., zinc price range of over 13¢ to 15¢ would lower discounts on 2 1/2 and 3-in. pipe by 2 points; zinc price in range over 7¢ to 9¢ would increase discounts. East St. Louis zinc price now 10¢ per lb.

(Effective Sept. 22, 1958)



## TOOL STEEL

F.o.b. mill	Cr	V	Mo	Co	per lb	SAE
W 4	1	—	—	—	\$1.84	T-1
18 4	1	—	—	5	2.545	T-4
18 4	2	—	—	—	2.005	T-2
1.5 4	1.5	8	—	—	1.20	M-1
6 4	3	6	—	—	1.59	M-3
6 4	2	5	—	—	1.345	M-2
High-carbon chromium	—	—	—	—	.955	D-3, D-5
Oil hardened manganese	—	—	—	—	.505	O-2
Special carbon	—	—	—	—	.38	W-1
Extra carbon	—	—	—	—	.38	W-1
Regular carbon	—	—	—	—	.325	W-1

Warehouse prices on and east of Mississippi are 4¢ per lb higher. West of Mississippi, 6¢ higher.

## CLAD STEEL

Base prices, cents per lb f.o.b.

Cladding	Plate (L4, C4, A3, J2)			Sheet (J2)
	10 pct	15 pct	20 pct	20 pct
302				37.50
304	28.80	31.55	34.30	40.00
316	42.20	46.25	50.25	58.75
321	34.50	37.75	41.05	47.25
347	40.80	44.65	48.55	57.00
405	24.60	26.90	29.25	
410	22.70	24.85	27.00	
430	23.45	25.65	27.90	

CR Strip (S9) Copper, 10 pct, 2 sides, 38.75; 1 side, 33.10.

## RAILS, TRACK SUPPLIES

F.o.b. Mill Cents Per Lb	No. 1 Std. Rail	Light Rails	Joint Bars	Track Spikes	Tie Plates	Track Bolts Untreated
Beazemer U1	5.75	6.725	7.25			15.35
Cleveland R3				10.10		
So. Chicago R3						
Ensley T2	5.75	6.725		10.10	6.875	
Fairfield T2	5.75	6.725		10.10	6.875	
Gary U1		6.50				
Huntington C16				10.10		
Ind. Harbor Y1				10.10		
Johnstown B3		6.725	7.25			
Joliet U1				10.10		
Kansas City S2				10.10		15.35
Lackawanna B3	5.75	6.725	7.25	6.875		
Lebanon B3		7.25				15.35
Minnequa C6	5.75	7.225	7.25	10.10	6.875	15.35
Pittsburgh P3				10.10		14.75
Pittsburgh J5				10.10		
Seattle B2				6.75	15.85	
Steelton B3	5.75		7.25	6.875		
Struthers Y1				10.10		
Terrace C7				6.75		
Williamport S5		6.50				
Youngstown R3				10.10		

## COKE

Furnace, beehive (f.o.b.)	Net-Ton
Connellsville, Pa.	\$14.50
Foundry, beehive (f.o.b.)	\$18.50 to \$18.50
Foundry oven coke	
Buffalo, del'd	\$31.75
Detroit, f.o.b.	30.50
New England, del'd	31.55
Kearney, N. J., f.o.b.	29.75
Philadelphia, f.o.b.	29.50
Swedenland, Pa., f.o.b.	29.50
Palmsville, Ohio, f.o.b.	30.50
Erie, Pa., f.o.b.	30.50
Cleveland, del'd	32.65
Cincinnati, del'd	31.84
St. Paul, f.o.b.	29.75
St. Louis, f.o.b.	31.50
Birmingham, f.o.b.	28.85
Milwaukee, f.o.b.	30.50
Neville, Pa.	29.25

## LAKE SUPERIOR ORES

51.50% Fe natural content, delivered lower Lake ports. Prices for 1958 season. Freight changes for seller's account.	
Openhearth lump	\$12.70
Old range, nonbessemer	11.85
Old range, nonbessemer	11.70
Mesabi, bessemer	11.80
Mesabi, nonbessemer	11.45
High phosphorus	11.45

## ELECTRICAL SHEETS

22-Gage	F.o.b. Mill Cents Per Lb	Hot-Rolled (Cut Lengths)*	Cold-Reduced (Coiled or Cut Length)	
			Semi-Processed	Fully Processed
Field			9.875	
Armature		11.70	11.20	11.70
Elect.		12.40	11.90	12.40
Special Motor			12.475	
Motor		13.55	13.05	13.55
Dynamo		14.65	14.15	14.65
Trans. 72		15.70	15.20	15.70
Trans. 65		16.30		
Trans. 58		16.80	19.70	
Trans. 52		17.85	20.20	
			20.70	

Producing points: Beech Bottom (W5); Brackenridge (A1); Granite City (G2); Indiana Harbor (I3); Mansfield (E2); Newport, Ky. (A9); Niles, O. (N3); Vandergrift (U1); Warren, O. (R3); Zanesville, Butler (A7).

## ELECTRODES

Cents per lb. f.o.b. plant, threaded, with nipples, unboxed.

GRAPHITE			CARBON*		
Diam. (in.)	Length (in.)	Price	Diam. (in.)	Length (in.)	Price
24	84	26.00	40	100, 110	10.70
20	72	25.25	35	110	10.70
18	72	25.75	30	110	10.85
14	72	25.75	24	72 to 84	11.25
12	72	26.25	20	90	11.00
10	60	26.00	17	72	11.40
10	48	28.50	14	72	11.85
7	60	28.25	12	60	12.95
6	60	31.50	10	60	13.00
4	40	35.00	8	60	13.30
3	40	37.00			
2 1/2	30	39.25			
2	24	68.75			

\* Prices shown cover carbon nipples.

## REFRACTORIES

## Fire Clay Brick

Super duty, Mo., Pa., Md., Ky.	\$185.00
High duty (except Salina, Pa.)	
add \$5.00	140.00
Medium duty	125.00
Low duty (except Salina, Pa.)	
add \$2.00	103.00
Ground fire clay, net ton, bulk	22.50

## Silica Brick

Mt. Union, Pa., Ensley, Ala.	\$158.00
Childs, Hays, Latrobe, Pa.	163.00
Chicago District	168.00
Western Utah	183.00
California	165.00

## Super Duty

Hays, Pa., Athens, Tex., Windham, Warren, O., Morrisville	163.00
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Silica cement, net ton, bulk, Latrobe 29.75

Silica cement, net ton, bulk, Chicago 26.75

Silica cement, net ton, bulk, Ensley, Ala. 27.75

Silica cement, net ton, bulk, Mt. Union 25.75

Silica cement, net ton, bulk, Utah and Calif. 39.00

## Chrome Brick

Standard chemically bonded, Balt. \$105.00

Standard chemically bonded, Curtin, Calif. 115.00

Burned, Balt. 99.00

## Magnesite Brick

Standard Baltimore \$131.00

Chemically bonded, Baltimore 116.00

## Grain Magnesite

St. % to 1/4-in. grains

Domestic, f.o.b. Baltimore in bulk. \$73.00

Domestic, f.o.b. Chewah, Wash., Luning, Nev.

in bulk 46.00

in sacks \$52.00-54.00

## Dead Burned Dolomite

Per net ton

F.o.b. bulk, producing points in:

Pa., W. Va., Ohio \$16.75

Missouri Valley 15.00

Midwest 17.00

## MERCHANT WIRE PRODUCTS

F.o.b. Mill	Standard Q Coated Nails		Fence Posts		Single Loop Bale Ties		Galv. Barbed and Twisted Barbless Wire		Merch. Wire Ann'd		Merch. Wire Galv.	
	Col	Col	Col	Col	Col	Col	Col	Col	c lb.	c lb.	c lb.	c lb.
Alabama City R3	173	187			212	193			9.00	9.55		
Aliquippa J3**	173	190				190			9.00	9.675		
Atlanta A8**	175	192			214	198			8.75	9.425		
Bartonsville K2**	175	192		178	214	198			9.10	9.775		
Buffalo H6									9.00	9.55		
Chicago N4***	173	190		172	212	196			8.65	9.325		
Chicago R3									9.00	9.55		
Cleveland A6												
Cleveland A5									9.00			
Crawf'v. M4**	175	192			214	198			8.75	9.425		
Donora, Pa. A5	173	187			212	193			9.00	9.55		
Duluth A5	173	187			212	193			9.00	9.55		
Fairfield, Ala. T2	187	187			212	193			9.00	9.55		
Galveston D4	9.10											
Houston S2	178	192			217	198			9.25	9.80		
Jacksonville M4	184-1	197			219	203			9.00	9.675		
Johnstown B3**	173	190		172	196				8.65	9.325		
Joliet, Ill. A5	173	187			212	193			9.00	9.55		
Kokomo C9	175	189			214	195*			9.10	9.65*		
L. Angeles B2***									9.95	10.625		
Kansas City S2*	178	192			217	198*			9.25	9.80		
Minnequa C6	178	192		177	217	198*			9.25	9.80		
Monessen P6						193			8.65	9.20		
Palmer, Mass. W6									9.30	9.85*		
Pittsburgh, Cal. C7	192	210							9.60	10.15		
Rancho, Pa. A5	173	187				193			9.00	9.55		
S. Chicago R3	173	187				193			8.65	9.20		
S. San Fran. C6						236			9.95	10.50		
Sparrows Pt. B3**	175					214	198		8.75	9.425		
Struthers, O. Y1*									8.65	9.30		
Worcester A5	179								9.30	9.85		
Williamport S5												

\* Zinc less than .10¢. \*\*\* .10¢ zinc.

\* 11-12¢ zinc. † Plus zinc extras.

‡ Wholesalers only.

## C-R SPRING STEEL

Cents Per Lb F.o.b. Mill	CARBON CONTENT				
	0.26-0.40	0.41-0.60	0.61-0.80	0.81-1.05	1.06-1.35
Anderson, Ind. C4	8.95	10.40	12.60	15.60	18.55
Baltimore, Md. T8	9.50	10.70	12.90	15.90	18.85
Bristol, Conn. W12		10.70	12.90	16.10	19.30
Beaton T8	9.50	10.70	12.90	15.90	18.85
Buffalo, N. Y. R7	8.95	10.40	12.60	15.60	18.55
Carnegie, Pa. S9	8.95	10.40	12.60	15.60	18.55
Cleveland A5	8.95	10.40	12.60	15.60	18.55
Darborsn S1	9.65	10.50	12.70		
Detroit D1	9.65	10.50	12.70	15.70	
Detroit D2	9.65	10.50	12.70		
Dover, O. G4	8.95	10.40	12.60	15.60	18.55
Evansville, Ind. M8	9.65	10.40	12.60		
Franklin Park, Ill. T8	9.65	10.40	12.60	15.60	18.55
Harrison, N. J. C11		12.90	16.10	19.30	
Indianapolis R5	9.10	10.50	12.60	15.60	18.55
Los Angeles C1	11.15	12.60	14.80	17.90	
New Britain, Conn. S7	9.40	10.70	12.90	15.90	18.85
New Castle, Pa. B4	8.95	10.40	12.60	15.60	
New Haven, Conn. D1	9.40	10.70	12.90	15.90	
Pawtucket, R. I. N7	9.50	10.70	12.90	15.90	18.85
Riverdale, Ill. A1	9.65	10.40	12.60	15.60	18.55
Sharon, Pa. S1	8.95	10.40	12.60	15.60	18.55
Trenton, R4	9.10	10.70	12.90	15.90	18.85
Wallingford W1	9.40	10.70	12.90	15.90	18.55
Warren, Ohio T4	8.95	10.40	12.60	15.60	18.75
Worcester, Mass. A5	9.50	10.70	12.90	15.90	18.85
Youngstown R5	9.10	10.55	12.60	15.60	18.55

## BOILER TUBES

\$ per 100 ft. carload lots cut 10 to 24 ft. F.o.b. Mill	Size		Seamless		Elec. Weld
	OD. in.	B.W. Gv.	H.R.	C.D.	H.R.
Babcock & Wilcox	2	13	40.28	47.21	35.22
	2½	12	54.23	63.57	47.43
	3	12	62.62	73.40	54.77
	3½	11	73.11	85.70	63.93
	4	10	97.08	113.80	85.53
National Tube...	2	13	40.28	47.21	35.22
	2½	12	54.23	63.57	47.43
	3	12	62.62	73.40	54.77
	3½	11	73.11	85.70	63.93
	4	10	97.08	113.80	85.53
Pittsburgh Steel	2	13	40.28	47.21	.....
	2½	12	54.23	63.57	.....
	3	12	62.62	73.40	.....
	3½	11	73.11	85.70	.....
	4	10	97.08	113.80	.....

## METAL POWDERS

Per pound, f.o.b. shipping point, in ton lots for minus 100 mesh

Swedish sponge iron, 98+ % Fe, f.o.b. Camden or Riverton, N. J., 100 mesh, freight allowed east of Miss. River, ocean bags, 23,000 lbs. and over	10.5¢
Domestic sponge iron, 98+ % Fe, f.o.b. Riverton, N. J., 100 mesh, freight allowed east of Miss. River, 100 lb. bags	10.5¢
100 mesh, cutting and scarring grade, 100 lb. bags	8.5¢
40 mesh, 100 lb. bags	7.7¢
Canadian sponge iron, del'd in East, carloads	10.5¢
Atomized iron powder, 98% + Fe, 40 mesh, F.O.B. Easton, Pa., in 100 lb. bags	7.7¢
Atomized iron powder, 98% + Fe, F.O.B. Easton, Pa., in 100 lb. bags—RZ-365—Freight allowed east of Miss. River	10.5¢
Atomized iron powder, 98% + Fe, Cutting and scarring grade, F.O.B. Easton, Pa.	8.5¢
Electrolytic iron, annealed, imported 99.5+ % Fe	24.6¢
200 mesh	33.0¢
Electrolytic iron, unannealed minus 325 mesh, 99+ % Fe	57.0¢
Carbonyl iron size 3 to 20 micron, 99%, 99.8+ % Fe, 88.0¢ to \$2.85	
Aluminum, freight allowed	38.0¢
Brass, 5000 lb. lots	31.0¢ to 46.7¢
Copper, electrolytic	41.0¢
Copper, atomized	39.8¢ to 48.3¢
Chromium, electrolytic, 99.85% min. Fe 03 mix. Del'd	\$5.00
Lead, f.o.b. Hammond, Ind. (2000 lbs. or more)	19¢
Manganese f.o.b. Extron, Pa.	46.0¢
Molybdenum, 99%	\$3.60 to \$3.95
Nickel	\$1.05 to \$1.13
Solder powder	1¢ plus met. value
Stainless steel, 302	\$1.07
Stainless steel, 316	\$1.26
Tin	14.00¢ plus metal value
Tungsten, 99% (65 mesh) \$3.15 (nominal) inc. 5000 lb & over	17.5¢ to 30.7¢
Bronze	47.2¢ to 51.5¢
Nickel Silver	48.8¢ to 53.5¢

## BOLTS, NUTS, RIVETS, SCREWS

(Base discount, f.o.b. mill)

Pct. Discounts

Machine and Carriage Bolts	Less than Container Price	1-4 Containers	5 Containers	20,000 Lb.
1/4" and smaller x 6" and shorter	34	53	58	62
5/8" x 3" x longer than 6"	0	27	34	41
Roll thread carriage bolts 1/4" & smaller x 6" and shorter	33	46	54	56
Lag, all diam. x 6" & shorter	10	28	35	42
Lag, all diam. longer than 6 in.	9	13	22	30
Plow bolts, 1/4" and smaller x 6" and shorter	10	28	35	42

(Add 25 pct for broken case quantities)

Nuts, Hex, HP reg. & hvy.	Full case or Keg price
3/4 in. or smaller	62
1/2 in. to 1 1/2 in. inclusive	56
1 1/2 in. and larger	51 1/2

### C. P. Hex, reg. & hvy.

3/4 in. and smaller	62
1/2 in. to 1 1/2 in. inclusive	56
1 1/2 in. and larger	51 1/2

### Hot Galv. Hex Nuts (All Types)

3/4 in. and smaller	41
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### Semi-finished Hex Nuts

3/4 in. or smaller	62
1/2 in. to 1 1/2 in. inclusive	57
1 1/2 in. and larger	51 1/2

(Add 25 pct for broken case or hvy quantities)

### Finished

3/4 in. and smaller	65
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### Rivets

	Base per 100 lb
1/2 in. and larger	\$12.25
7/16 in. and smaller	19

Pct. Off List

## Cap Screws

Discount (Packages)

Full Finished H. C. Heat Treat

New std. hex head, packaged	Full case
3/4" diam. and smaller x 6" and shorter	54 42
1/2" diam. and 1" diam. x 6" and shorter	38 23
1/2" diam. and smaller x longer than 6"	.. ..
3/4", 1/2", and 1" diam. x longer than 6"	.. ..

C-1018 Steel Full-Finished Cartons Bulk

1/4" through 3/4" dia. x 6" and shorter	59 48
1/2" through 1" dia. x 6" and shorter	45 32
Minimum quantity—1/4" through 3/4" diam., 15,000 pieces; 7/16" through 1/2" diam., 5,000 pieces; 3/4" through 1" diam., 2,000 pieces.	

## Machine Screws & Stove Bolts

Plain Finish	Discount	Mach. Screws	Stove Bolts
Cartons	60	60	60
Bulk	Quantity		

To 1/4" diam. incl.	25,000-and over 60	..
5/16 to 3/4" diam. incl.	15,000-200,000	60 ..

## Machine Screws & Stove Bolt Nuts

In Cartons	Discount	Hex	Square
Quantity	16	19	19

In Bulk	Quantity		
3/4" diam. & smaller	25,000-and over 15	16	

## STEEL SERVICE CENTERS

Metropolitan Price, dollars per 100 lb.

Cities		Sheets			Strip	Plates	Shapes	Bars		Alloy Bars			
	City Delivery† Charge	Hot-Rolled (18 ga. & hvy.)	Cold-Rolled (15 gage)	Galvanized (10 gage)††	Hot-Rolled		Standard Structural	Hot-Rolled (merit)	Cold- Finished	Hot-Rolled 4615 As rolled	Hot-Rolled 4140 Annealed	Cold-Drawn 4615 As rolled	Cold-Drawn 4140 Annealed
Atlanta		8.50	9.87	10.13	8.64	8.97	9.05	9.01	10.68				
Baltimore	\$ .10	8.10	9.00	9.78	8.80	8.76	8.60	8.75	11.80*	16.28	15.28	19.82	19.08
Birmingham		8.18	9.45	10.46	8.51	8.89	9.00	8.99					
Easton	.15	9.48	10.54	11.55	9.84	10.17	10.13	10.26	13.49*	16.79	15.81	20.29	19.56
Buffalo	.15	8.40	9.15	11.22	8.90	9.35	9.40	9.30	11.60*	16.34	15.55	19.01	19.30
Chicago	.15	8.40	9.60	10.60	8.66	9.04	9.15	9.14	9.30	16.20	15.20	19.70	18.95
Cincinnati	.15	8.58	9.65	10.60	8.98	9.42	9.71	9.46	11.68*	16.52	15.52	20.02	19.27
Cleveland	.15	8.51	9.60	10.35	8.78	9.28	9.54	9.25	11.40*	16.31	15.31	19.81	19.06
Denver	.20	9.60	11.84	12.94	9.63	9.96	10.04	10.00	11.19				20.84
Detroit	.15	8.66	9.85	10.96	9.03	9.41	9.71	9.45	9.66	15.46	15.48	18.81	19.23
Houston		8.10	8.60		8.15	8.45	8.05	8.10	11.60	16.20	15.25	19.65	18.95
Kansas City	.15	9.02	10.27	10.82	9.33	9.71	9.82	9.81	10.22	20.02	15.47	20.02	19.27
Los Angeles		8.70*	11.20	12.15	9.15	9.10	9.25	9.10	12.95	17.30	16.35	21.30	20.60
Memphis	.15	8.55	9.80		8.60	8.93	9.01	8.97	12.11*				
Milwaukee	.15	8.54	9.73	10.74	8.80	9.18	9.37	9.28	9.54	16.34	15.34	19.84	19.09
New York	.10	8.97	10.23	10.66	9.74	9.87	9.84	10.09	13.31*	16.16	15.60	20.10	19.35
Norfolk	.20	8.20			8.90	8.65	9.20	8.90	10.70				
Philadelphia	.10	8.10	10.00	11.27	8.80	8.85	8.60	8.75	12.05*	16.58	15.58	20.08	19.33
Pittsburgh	.15	8.50	9.70	11.00	8.76	9.05	9.15	9.14	11.40*	16.20	15.20	19.70	18.95
Portland		10.00 <sup>1</sup>	11.75 <sup>2</sup>	13.30 <sup>3</sup>	11.95 <sup>4</sup>	11.50 <sup>5</sup>	11.10 <sup>6</sup>	9.85 <sup>7</sup>	15.30*	18.50	17.45	20.75	20.25
San Francisco	.10	9.75	11.20	11.40	9.85	10.10	9.85	10.25	13.85	17.05	16.35	21.05	20.60
Seattle		9.95	11.15	12.20	10.00	9.70	9.80	10.10	14.70	17.15	16.80	20.65	20.60
Spokane	.15	10.10	11.30	12.15	10.15	9.85	9.95	10.25	14.85	17.75	16.95	21.35	20.75
St. Louis	.15	8.69	9.94	10.98	9.04	9.42	9.63	9.52	9.93	16.38	15.38	20.08	19.33
St. Paul	.15	8.94	10.19	10.86	8.99	9.45	9.53	9.70 <sup>7</sup>	10.16		15.41		19.21

Base Quantities (Standard unless otherwise keyed): Cold finished bars: 2000 lb or over. Alloy bars: 1000 to 1999 lb. All others: 2000 to 4999 lb. All HR products may be combined for quantity. All galvanized sheets may be combined for quantity. CR sheets may be combined with each other for quantity. \*All sizes except 18 and 16 gage.  
† 104 zinc. ‡ Deduct for country delivery. \* C1018—1 in. rounds, 1 1/2 ga. x 36" x 120"; 20 ga. x 36" x 120"; 26 ga. x 30" x 96"; 4 1/2" x 1" in lots of 1000 to 9999; 4 sheared plate 1/4" x 84" in lots of 1000 to 9999; 8" x 8.70" in lots of 1000 to 9999; M-1020—1-in. rounds in lots of 1000 to 9999. 15 ga. & heavier.

(Effective Sept. 22, 1958)

## ELECTROPLATING SUPPLIES

### Anodes

(Cents per lb, fct allowed in quantity)

Copper	
Roller elliptical, 18 in. or longer, 5000 lb lots	41.50
Electrodeposited	32.75
Brass, 80-20, ball anodes, 2000 lb or more	45.50
Zinc, ball anodes, 2000 lb lots (for elliptical add 1¢ per lb)	16.50
Nickel, 99 pct plus, rolled carton, 5000 lb	1.0225
(Rolled depolarized add 3¢ per lb)	
Cadmium	1.55
Tin, ball anodes \$1.05 per lb (approx.).	

### Chemicals

(Cents per lb, f.o.b. shipping point)	
Copper cyanide, 100 lb drum	66.20
Copper sulphate, 100 lb bags, per cwt.	22.15
Nickel salts, single, 100 lb bags	45.00
Nickel chloride, freight allowed, 100 lb	82.25
Sodium cyanide, domestic, f.o.b. N. Y., 200 lb drums	23.70
(Philadelphia price 24.15)	
Zinc cyanide, 100 lb	60.75
Potassium cyanide, 100 lb drum	45.50
Chronic acid, flake type, 10,000 lb or more	30.44

## CAST IRON WATER PIPE INDEX

Birmingham	125.8
New York	138.7
Chicago	140.9
San Francisco-L. A.	148.6

Dec. 1955, value, Class B or heavier 5 in. or larger, bell and spigot pipe. Explanation: p. 57, Sept. 1, 1955, issue. Source: U. S. Pipe and Foundry Co.

# PIG IRON

Dollars per gross ton, f.o.b., subject to switching charges.

Producing Point	Basic	Fdry.	Mal.	Boas.	Low Phos.
Birdsboro, Pa. B6	68.00	68.50	69.00	69.50	
Birmingham R3	62.00	62.50			
Birmingham W9	62.00	62.50	66.50		
Birmingham U4	62.00	62.50	66.50		
Buffalo R3	66.00	66.50	67.00	67.50	
Buffalo H1	66.00	66.50	67.00	67.50	
Buffalo W8	66.00	66.50	67.00	67.50	
Chesler P2	66.50	67.00	67.50		
Chicago J4	66.00	66.50	66.50	67.00	
Cleveland A5	66.00	66.50	66.50	67.00	71.00
Cleveland R3	66.00	66.50	66.50	67.00	
Duluth 14	66.00	66.50	66.50	67.00	71.00
Erie 14	66.00	66.50	66.50	67.00	71.00
Everett M6	67.50	68.00	68.50		
Fontana K1	75.00	75.50			
Geneseo, Utah C7	66.00	66.50			
Granite City G2	67.90	68.40	68.90		
Hubbard V1			66.50		
Ironton, Utah C7	66.00	66.50			
Midland C11	66.00				
Minneapolis C6	63.00	63.50	69.00		
Minneapolis P6	66.00				
Neville Ia. P4	66.00	66.50	67.00	71.00	
N. Tonawanda T1	66.00	66.50	67.00	67.50	
Sharpsville S3	66.00	66.50	67.00		
So. Chicago R3	66.00	66.50	67.00		
So. Chicago W8	66.00	66.50	67.00		
Swedeland A2	63.00	63.50	69.00	69.50	
Toledo J4	66.00	66.50	67.00		
Troy, N. Y. R3	68.00	68.50			73.00
Youngstown Y1			66.50	67.00	

**DIFFERENTIALS:** Add, 75¢ per ton for each 0.25 pct silicon or portion thereof over base (1.75 to 2.25 pct except low phos., 1.75 to 2.00 pct) 50¢ per ton for each 0.25 pct manganese or portion thereof over 1 pct, \$2 per ton for 0.50 to 0.75 pct nickel, \$1 for each additional 0.25 pct nickel. Add \$1.00 for 0.31-0.69 pct phos.

**Silvery Iron:** Buffalo (6 pct), H1, \$79.25; Jackson J1, 14 (Globe Div.), \$78.00; Niagara Falls (15.01-15.50), \$101.00; Keokuk (14.01-14.50), \$103.50; (15.51-16.00), \$106.50. Add \$1.00 per ton for each 0.50 pct silicon over base (6.01 to 6.50 pct) up to 18 pct. Add \$1.25 for each 0.50 pct manganese over 1.00 pct. Bessemer silvery pig iron (under .10 pct phos.); \$64.00. Add \$1.00 premium for all grades silvery to 18 pct.

† Intermediate low phos.

# STAINLESS STEEL

Base price cents per lb. f.o.b. mill

Product	201	202	301	302	303	304	316	321	347	403	410	416	430
Ingot, reroll.	22.00	23.75	23.25	25.25	—	27.00	39.75	32.25	37.00	—	16.75	—	17.00
Slabs, billets	27.00	30.25	28.00	31.50	32.00	33.25	40.50	40.00	46.50	—	21.50	—	21.75
Billets, forging	—	36.50	37.25	38.00	41.00	40.50	62.25	47.00	55.75	28.25	28.25	28.75	28.75
Bars, struct.	42.00	43.00	44.25	45.00	48.00	47.75	73.00	55.50	64.75	33.75	33.75	34.25	34.25
Plates	39.25	40.00	41.25	42.25	45.00	45.75	71.75	54.75	64.75	30.00	30.00	31.25	31.00
Sheets	48.50	49.25	51.25	52.00	56.75	55.00	80.75	65.50	79.25	40.25	40.25	48.25	40.75
Strip, hot-rolled	36.00	39.00	37.25	40.50	—	44.25	69.25	53.50	63.50	—	31.00	—	32.00
Strip, cold-rolled	45.00	49.25	47.50	52.00	56.75	55.00	80.75	65.50	79.25	40.25	40.25	42.50	40.75
Wire CF; Rod HR	40.00	40.75	42.00	42.75	45.50	45.25	69.25	52.50-52.75	61.50	32.00	32.00	32.50	32.50

## STAINLESS STEEL PRODUCING POINTS:

**Sheets:** Midland, Pa., C11; Brackenridge, Pa., A3; Butler, Pa., A7; Vandergrift, Pa., U1; Washington, Pa., W2, J2; Baltimore, El; Middletown, O., A7; Massillon, O., R3; Gary, U1; Bridgeville, Pa., U3; New Castle, Ind., I2; Detroit, M2; Louisville, O., R5.

**Strip:** Midland, Pa., C11; Waukegan, Cleveland, A5; Carnegie, Pa., S9; McKeesport, Pa., F1; Reading, Pa., C2; Washington, Pa., W2; W. Leeburg, Pa., A3; Bridgeville, Pa., U2; Detroit, M2; Canton, Massillon, O., R3; Harrison, N. J., D3; Youngstown, R5; Sharon, Pa., S1; Butler, Pa., A7; Wallingford, Conn., U3 (plus further conversion extras); W1 (25¢ per lb. higher); New Bedford, Mass., R6; Gary, U1 (25¢ per lb. higher).

**Bar:** Baltimore, A7; S. Duquesne, Pa., U1; Munhall, Pa., U1; Reading, Pa., C2; Titusville, Pa., U2; Washington, Pa., J2; McKeesport, Pa., U1, F1; Bridgeville, Pa., U3; Dunkirk, N. Y., A1; Massillon, O., R5; S. Chicago, U1; Syracuse, N. Y., C11; Watervliet, N. Y., A5; Waukegan, A5; Canton, O., T5, R3; Ft. Wayne, I4; Detroit, R5; Gary, U1; Owensboro, Ky., G5; Bridgeport, Conn., N8.

**Wire:** Waukegan, A5; Massillon, O., R3; McKeesport, Pa., F1; Ft. Wayne, J4; Harrison, N. J., D3; Baltimore, A7; Dunkirk, A3; Monessen, P1; Syracuse, C11; Bridgeville, U2; Detroit, R5.

**Structurals:** Baltimore, A7; Massillon, O., R3; Chicago, Ill., J4; Watervliet, N. Y., A3; Syracuse, C11; S. Chicago, U1.

**Plates:** Baltimore, El; Brackenridge, Pa., A3; Chicago, U1; Munhall, Pa., U1; Midland, Pa., C11; New Castle, Ind., I2; Middletown, A7; Washington, Pa., J2; Cleveland, Massillon, R3; Coatesville, Pa., C15; Vandergrift, Pa., U1; Gary, U1.

**Forging billets:** Midland, Pa., C11; Baltimore, A7; Washington, Pa., J2; McKeesport, F1; Massillon, Canton, O., R5; Watervliet, A3; Pittsburgh, Chicago, U1; Syracuse, C11; Detroit, R5; Munhall, Pa., S. Chicago, U1; Owensboro, Ky., G5; Bridgeport, Conn., N8.

(Effective Sept. 22, 1958)

# LET "TOUGHIE"



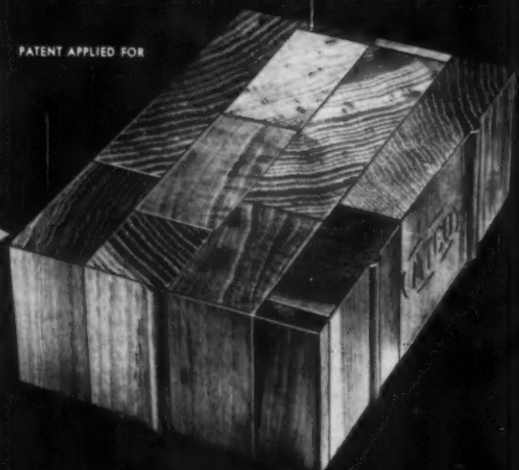
# CUT FLOOR COSTS ... FOR YOU

- Last from four to five times longer than blocks of softer woods.
- Eliminates frequent replacement labor costs.
- Less production inconvenience due to longer life.
- Made to your exact size specifications.
- Made exclusively from hickory-pecan, toughest of all domestic woods.
- Laminated under hydraulic pressure.

(ATCO)  
REGD. T.M.

# HICKORY AISLE BLOCK

PATENT APPLIED FOR



Write for full information . . .

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"70 Years of Success!"

1242 NORTH SECOND ST. • MEMPHIS, TENN.



# FERROALLOY PRICES

## Ferrochrome

Cents per lb contained Cr, lump, bulk, carloads, del'd. 67-71% Cr, 30-1.00% max. Si.			
0.02% C	41.00	0.50% C	38.00
0.05% C	39.00	1.00% C	37.75
0.10% C	38.50	1.50% C	37.50
0.20% C	38.25	2.00% C	37.25
4.00-4.50% C, 60-70% Cr, 1-2% Si.	28.75		
5.50-5.00% C, 57-64% Cr, 2.00-4.50% Si.	27.50		
0.025% C (Simplex)	36.75		
0.10% C, 52-57% Cr, 2.00% max Si.	37.50		
7-14% max C, 50-55% Cr, 3-8% max Si.	22.50		
7-8 1/4% max C, 50-55% Cr, 3% max Si.	25.00		

## High Nitrogen Ferrochrome

Low-carbon type 0.75% N. Add 5¢ per lb to regular low carbon ferrochrome max. 0.10% C price schedule. Add 5¢ for each additional 0.25% of N.

## Chromium Metal

Per lb chromium, contained, packed, delivered, ton lots, 97% min. Cr, 1% max. Fe.	
0.10% max. C	\$1.31
0.50% max. C	1.31
9 to 11% C, 88-91% Cr, 0.75% Fe.	1.40

## Electrolytic Chromium Metal

Per lb of metal 2" x D plate (1/4" thick) delivered packed, 99.80% min. Cr. (Metallic Base) Fe 0.20 max.	
Carloads	\$1.29
Ton lots	1.31
Less ton lots	1.33

## Low Carbon Ferrochrome Silicon

(Cr 34-41%, Si 42-45%, C 0.05% max.) Carloads, delivered, lump, 3-in. x down, packed.			
Price is sum of contained Cr and contained Si.			
	Cr	Si	
Carloads, bulk	27.50	14.20	
Ton lots	32.75	15.65	
Less ton lots	34.35	17.30	

## Calcium-Silicon

Per lb of alloy, lump, delivered, packed. 30-33% Cr, 60-65% Si, 3.00 max. Fe.	
Carloads	25.65
Ton lots	27.95
Less ton lots	29.45

## Calcium-Manganese-Silicon

Cents per lb of alloy, lump, delivered, packed.	
16-20% Ca, 14-18% Mn, 53-59% Si.	
Carloads	24.25
Ton lots	26.15
Less ton lots	27.15

## SMZ

Cents per pound of alloy, delivered, 60-65% Si, 5-7% Mn, 5-7% Zr, 20% Fe 1/2 in. x 12 mesh.	
Ton lots	21.15
Less ton lots	22.40

## V Foundry Alloy

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis, V-5; 38-42% Cr, 17-19% Si, 8-11% Mn, packed.	
Carload lots	18.45
Ton lots	19.95
Less ton lots	21.20

## Graphidox No. 4

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis, Si 48 to 52%, Ti 9 to 11%, Ca 5 to 7%.	
Carload packed	19.20
Ton lots to carload packed	21.15
Less ton lots	22.40

## Ferromanganese

Maximum base price, f.o.b., lump size, base content 74 to 76 pct Mn.

Producing Point		Cents per-lb
Marietta, Ashtabula, O.; Alloy, W. Va.; Sheffield, Ala.; Portland, Ore.		12.25
Johnstown, Pa.		12.25
Neville Island, Pa.		12.25
Sheridan, Pa.		12.25
Philo, Ohio		12.25
S. Duquesne		12.25
Add or subtract 0.1¢ for each 1 pct Mn above or below base content.		
Briquets, delivered, 66 pct Mn:		
Carloads, bulk		14.80
Ton lots packed in bags		17.20

## Spiegeleisen

Per gross ton, lump, f.o.b. Palmerton, Pa., and Neville Island, Pa.		
Manganese	Silicon	
16 to 19%	3% max.	\$100.50
19 to 21%	3% max.	102.50
21 to 23%	3% max.	105.00

## Manganese Metal

2 in. x down, cents per pound of metal delivered.	
95.50% min. Mn, 0.2% max. C, 1% max. Si, 2.5% max. Fe.	
Carload, packed	45.75
Ton lots	47.25

## Electrolytic Manganese

F.o.b. Knoxville, Tenn., freight allowed east of Mississippi, f.o.b. Marietta, O., delivered, cents per pound.	
Carloads	34.00
Ton lots	36.00
250 to 1999 lb	38.00
Premium for Hydrogen - removed metal	0.75

## Medium Carbon Ferromanganese

Mn 80 to 85%, C 1.25 to 1.50, Si 1.50% max., carloads, lump, bulk, delivered, per lb of contained Mn	
	35.50

## Low-Carb Ferromanganese

Cents per pound Mn contained, lump size, del'd Mn 85-90%.			
	Carloads	Ton	Less
0.07% max. C, 0.06% P, 90% Mn	(Bulk)		
0.07% max. C	37.15	39.55	41.15
0.10% max. C	35.10	37.90	39.10
0.15% max. C	34.35	37.15	38.35
0.30% max. C	33.60	36.40	37.60
0.50% max. C	32.10	34.90	36.10
0.75% max. C, 80.85% Mn, 5.0-7.0% Si	31.60	34.40	35.60
	28.60	31.40	32.60

## Silicomanganese

Lump size, cents per pound of metal, 65-68% Mn, 18-20% Si, 1.5% max. C for 2% max. C, deduct 0.2¢ f.o.b. shipping point.	
Carloads bulk	12.80
Ton lots, packed	14.45
Briquet contract basis carloads, bulk, delivered, per lb of briquet	15.10
Packed, pallets, 3000 lb up to carloads	16.50

## Silvery Iron (electric furnace)

Si 15.50 to 16.00 pct, f.o.b. Keokuk, Iowa, or Wenatchee, Wash., \$106.50 gross ton, freight allowed to normal trade area. Si 15.01 to 15.50 pct, f.o.b. Niagara Falls, N. Y., \$93.00.	
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## Silicon Metal

Cents per pound contained Si, lump size, delivered, packed.			
	Ton lots	Carloads, packed	
96.75% Si, 1.25% Fe.	24.20	22.90	
98% Si, 0.75% Fe	24.95	23.65	

## Silicon Briquets

Cents per pound of briquets, bulk, delivered, 40% Si, 2 lb Si, briquets.	
Carloads, bulk	7.70
Ton lots, packed	10.50

## Electric Ferrosilicon

Cents per lb contained Si, lump, bulk, carloads, f.o.b. shipping point.			
50% Si	14.20	75% Si	16.40
65% Si	15.25	85% Si	18.10
	90% Si		19.50

## Ferrovandium

50-55% V delivered, per pound, contained V, in any quantity.	
Openhearth	3.20
Crucible	3.50
High speed steel (Primus)	3.40

## Calcium Metal

Eastern zone, cents per pound of metal, delivered.			
	Cast	Turnings	Distilled
Ton lots	\$2.05	\$2.95	\$3.75
100 to 1999 lb.	2.40	3.30	4.55

(Effective Sept. 22, 1958)

Alisfer, 20% Al, 40% Si, 40% Fe, f.o.b. Suspension Bridge, N. Y., per lb.

Carloads, bulk	10.35¢
Ton lots	11.70¢

Calcium molybdate, 42.6-46.6% f.o.b. Langeloth, Pa., per pound contained Mo

	\$1.28
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Ferrocolumbium, 50-50%, 2 in. x D, delivered per pound contained Cb.

Ton lots	\$4.00
Less ton lots	4.05

Ferro-tantalum-columbium, 20% Ta, 40% Cb, 0.30% C, del'd ton lots, 2-in. x D per lb cont't Sb plus Ta

	\$3.80
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Ferromolybdenum, 55-75%, 200-lb containers, f.o.b. Langeloth, Pa., per pound contained Mo

	\$1.68
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Ferrophosphorus, electric, 23-26%, car lots, f.o.b. Siglo, Mt. Pleasant, Tenn., \$5.00 unitage, per gross ton

10 tons to less carload	\$120.00
	\$131.00

Ferrotitanium, 40% regular grade 0.10% C max., f.o.b. Niagara Falls, N. Y., and Cambridge, O., freight allowed, ton lots, per lb contained Ti

	\$1.35
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Ferrotitanium, 25% low carbon, 0.10% C max., f.o.b. Niagara Falls, N. Y., and Cambridge, O., freight allowed, ton lots, per lb contained Ti

	\$1.50
Less ton lots	\$1.54

Ferrotitanium, 15 to 18% high carbon, f.o.b. Niagara Falls, N. Y., freight allowed, carload per net ton

	\$240.00
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Ferrotungsten, 1/4 x down packed, per pounds contained W, ton lots delivered

	\$2.15 (nominal)
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Molybde oxide, briquets per lb contained Mo, f.o.b. Langeloth, Pa.

bags, f.o.b. Washington, Pa., Langeloth, Pa.	\$1.41
	\$1.38

Simnall, 20% Si, 20% Mn, 20% Al, f.o.b. Philo, Ohio, freight allowed per lb.

Carload, bulk lump	18.50¢
Ton lots, packed lump	20.50¢
Less ton lots	21.00¢

Vanadium oxide, 86-89% V<sub>2</sub>O<sub>5</sub> per pound contained V<sub>2</sub>O<sub>5</sub>

	\$1.38
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Zirconium, per lb of alloy 35-40% f.o.b. freight allowed, carloads, packed

12-15%, del'd lump, bulk-carloads	27.25¢
	9.25¢

## Boron Agents

Borasil, per lb of alloy del. f.o.b. Philo, Ohio, freight allowed, B 2-4%, Si 40-45%, per lb contained B

2000 lb carload	\$5.50
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Boritrans, f.o.b. Niagara Falls. Ton lots per pound

Less ton lots, per pound	50¢
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Corbortan, Ti 15-21%, B 1-2%, Si 2-4%, Al 1-2%, C 4-5-7.5%, f.o.b. Suspension Bridge, N. Y., freight allowed.

Ton lots per pound	14.00¢
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Ferroboreon, 17.50 min. B, 1.50% max. Si, 0.50% max. Al, 0.50% max. C, 1 in. x D, ton lots, f.o.b. Wash., Pa., Niagara Falls, N. Y., delivered 100 lb up

10 to 14% B	.85
14 to 19% B	1.20
19% min. B	1.50

Grainal, f.o.b. Cambridge, O., freight allowed, 100 lb and over No. 1

No. 79	\$1.05
	50¢

Manganese-Boron, 75.00% Mn, 15.20% B, 5% max. Fe, 1.50% max. Si, 3.00% max. C, 2 in. x D, del'd.

Ton lots (packed)	\$1.48
Less ton lots (packed)	1.57

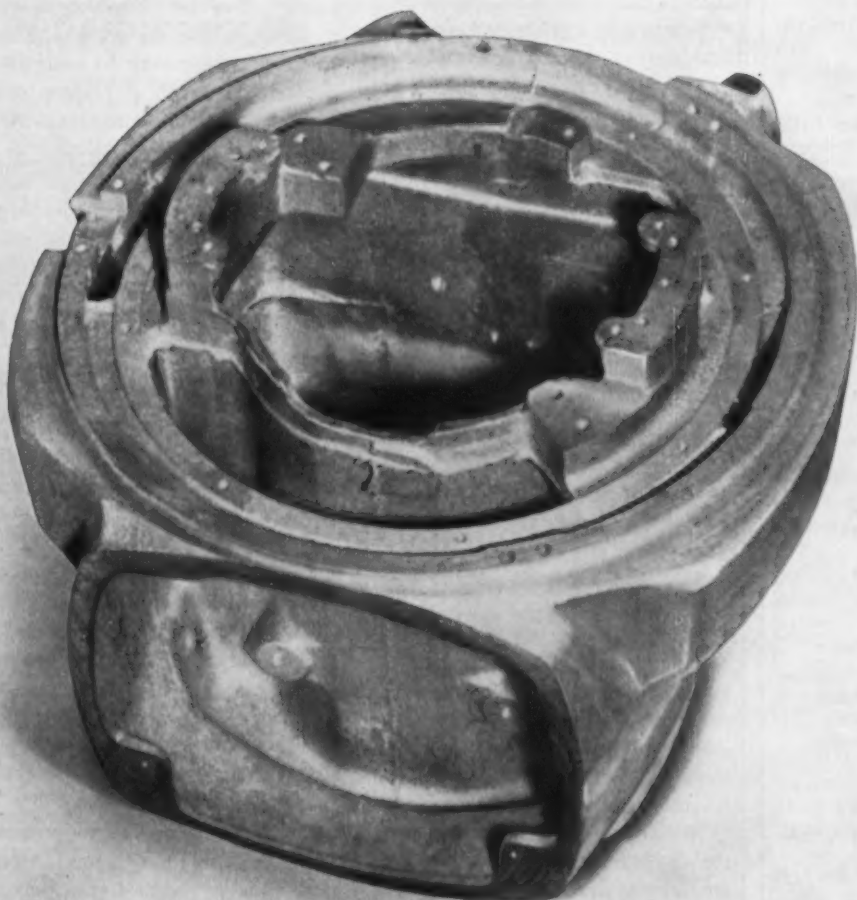
Nickel-Boron, 15-18% B, 1.00% max. Al, 1.50% max. Si, 0.50% max. C, 3.00% max. Fe, balance Ni, del'd less ton lots

	2.15
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- (1) 1250-H.P. Allis-Chalmers Motor, 600 V.D.C., 300/600 R.P.M.
- (1) S.S. 4-unit M.G. Set consists of 2500-H.P., 8 P.F. Syn. motor, 11000/4160-V., 3 ph., 60 cy. (1) 1060-K.W. Gen. 600-V.D.C. and (2) 760-K.W. 600-V.D.C. Generators, complete with exciter sets.
- (2) S.S. 645-H.P. Mill Motors, each 300-V.D.C., 1000 R.P.M. (used with above 1060-K.W. Gen.)
- (2) S.S. Reel Motors (mill type) each 940-H.P., 800/1000 R.P.M., 600-V.D.C. (used with above (2) 760-K.W. Gen.).

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## THE CLEARING HOUSE

# National Machinery Index Coming

**Used machine buyers from coast to coast will soon be able to use a complete, nation-wide index of dealers' stocks.**

**Developed by the MDNA, it will contain photographs, specs, and prices.**

■ When used machinery buyers go into the market in a couple of months they'll be able to use a nation-wide machinery index. In it they'll find the types of machines they want, plus pictures, specs, and prices.

The nation-wide inventory, now being prepared by the Machinery Dealers National Assn., will list from 2500 to 5000 available used machine tools, with photo and specifications in a coded list. Dealers will all have up-to-date copies.

**Finger-Tip Reference**—"This new coded index will put information at the finger-tips of all our 240 members across the country," says Elmer W. Pfeil, president of the association and of Elmer W. Pfeil, Inc., Cleveland machinery firm.

"As it is now it takes a week or more of letters and phone calls to get enough information on which to proceed. Under the new system, sheets will be sent out weekly so there will be a complete, up-to-date inventory at the local dealer's office.

"In case of national emergency, the list can be turned over to the government for faster mobilization of our resources.

"We are doing this as a service to the general buying public on an in-

dustry-wide basis. We feel that by pooling all the information, we can render much better service. Our customers will get faster service as well as a better selection of models."

**How It Will Work**—Under the new set-up, inventory sheets will be sent out weekly from association headquarters in Washington to members across the country. They will be broken down by code into general types such as planers, drill presses, horizontal boring mills, etc., and also carry specifications and a photo.

Dealers will pay a small charge so that the system will be self-sustaining. It is tentatively set to begin operation about mid-November. As far as is known, there has not been any previous attempt at a national inventory index.

**Sales Turn Corner**—Used machinery sales generally have weathered the recession and are now turning the corner, according to Mr. Pfeil.

"Business is picking up noticeably in both inquiries and actual sales," he says. "Activity is especially strong among smaller tool and die shops and machine shops. If they get a large enough order, they don't hesitate to go out and buy a machine now. And in some cases they're leasing new ones.

"Our members have possibly 40,000 machine tools items in stock now—one of the best selections in years. We're not out of the recession by any means but there is a better tone to the whole market."

# CONSIDER GOOD USED EQUIPMENT FIRST

## BENDING ROLLS

8" x 3/4" Bertch Initial Type  
12" x 3/4" Hillis & Jones Pyramid Type  
12" x 3/16" Bertch Initial Type—NEW  
32" x 3/4" Baldwin Pyramid Type

## BORING MILL—VERTICAL

144" Cincinnati Hypo Vertical Boring Mill  
Two Swivel Type Ram Heads

## CRANES—OVERHEAD ELECTRIC TRAVELING

7 1/2 ton P&H 60" Span 230 Volt D.C.  
8 ton P&H 55" Span 220/3/60  
10 ton P&H 50" Span 230 Volt D.C.  
10 ton P&H 39" Span 230 Volt D.C.  
10 ton Milwaukee 67" Span 230 Volt D.C.  
10 ton Shaw 49" Span 230 Volt D.C.  
10 ton Whiting 73" Span 220/3/60 A.C.  
10 ton Shaw 120" Span 230 Volt D.C.  
15 ton P&H 50" Span 230 Volt D.C.  
15 ton Northern 54" Span 230 Volt D.C.  
15 ton Shepard Niles 56" Span 230 Volt D.C.  
15 ton N-B-P 100" Span 220/3/60 A.C.  
120 ton Shepard Niles 77" Span 220/3/60

## DRAW BENCHES

3000 lb. Draw Bench, 20 ft. Pull  
7000 lb. Draw Bench, 50 ft. Pull—New 1956  
19,000 lb. Draw Bench, 50 ft. Draw—LATE

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1" to 5" Acme, Ajax, National

## HAMMERS—BOARD DROP—STEAM DROP—STEAM

FORGING 800 lb. to 12,000 lb. Incl.

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54" McKay 17 Rolls 4 1/2" dia.  
60" Antine Standard, 17 Rolls 4 1/2" dia.  
72" McKay, 13 Rolls 4 1/2" dia.  
84" Bls 17 Rolls 5 1/2" dia.

## PLANER—OPEN SIDE

70" x 110" x 16" Liberty Four Head

## PRESSES—HYDRAULIC

500 ton Watson Stillman Piercing Press 48" x 72"  
500 ton HPM Fasttraverse, Bed 36" x 36"  
600 ton Elmes 26" stroke, 48" x 48" Bed Cols.  
1000 ton HPM Fasttraverse, Bed 48" x 72", 36" Stroke  
4500 ton B-L-H, Bed 68x88", Stroke 40"

## PRESSES—STRAIGHT SIDE

190 ton Toledo #57 1/2", 10" Stroke, Bed 20" x 29"  
215 ton Clearing, 24" Stroke, Bed 36" x 42"

## PRESS—TOGGLE DRAWING

#168 1/2" Toledo, 18" Stroke of Blankholder, 26" Stroke  
of Plunger, Bed 48" x 51"

## PUNCH & SHEAR COMBINATIONS

Buffalo #1 1/2" Ironworker  
Cleveland Style C Arch Jaw, Capy. 1/4" x 1/4"  
Cleveland Style EF, Capy. 1/4" x 1"

## ROLLING MILLS

6" x 5" Torrington Flat Wire Mill Line  
3 1/2" x 7" Six Roll Cluster Mill  
10" x 14" Single Stand Two High  
10" x 10" Single Stand Two High  
12" x 12" Single Stand Two High  
12" x 10" Single Stand Two High  
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18 Stand Custom Built, 2 1/2" Shaft, will take 36" wide

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108" Bertch, Seven Rolls 9" Dia.  
72" Niles 7 Rolls 9" Dia. Motor Driven

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6 x 6 x 3/4" Hillis & Jones

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36" x .020 Ga. Hallden Shear Line  
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6" x 14 Ga. Edwards, Motor Drive—LATE  
10" x 3/4" Niagara  
14" x 3/16" Cincinnati #1814

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12" Waterbury Farrel, 2 1/2" Dia. Arbor  
24" Blake & Johnson, 3 1/2" Dia. Arbor  
36" Yoder, 4 1/2" Dia. Arbor

## STRAIGHTENERS

Torrington 12 Roll Capy. 1 1/2" Bq. Etc.  
Kane & Rosch #5250 5-Roll, Capy. 2 1/2" Solid,  
3 1/2" Tube

## SWAGING MACHINES

Medart O.A. Capy. 1/4" to 1" Solid  
1 1/2" Shuster, With 12 ft. Cut Off  
1 1/2" Shuster, With 12 ft. Cut Off

## TESTING MACHINES

#4A Standard 2-Die, Capy. 2 1/2" Tube  
26 1/2" Penn Capacity 3 1/2" Tube 1 1/2" Solid  
10" Die Length Hydraulic Feed, LATE

## THREAD ROLLERS

No. 69 Waterbury Farrel, for vertical operation  
No. 106 Waterbury Farrel Thread Roller

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1 1/2" Tube Reducer for steel  
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592 CFM 125 psi 12 x 13 Worth. H.B.  
585 CFM 100 psi 13-9/16 x 12 Ing. RE 3-60-4180.  
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1007 CFM 100 psi 19-11 x 12 Chis. OCB.  
1008 CFM 100 psi 16-10/16 x 8 Worth. YC.  
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1055 CFM 100 psi 18-11 x 12 Ing. XRE.  
175 HP 3-60-440—SAR.  
1419 CFM 35 psi 20 x 13 Worth. H.B.—unused.  
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1	800	Whae.	CW	550	1776
1	700	A.C.		2200	590
1	500	Whae.	CW-4-3ED-15	440	1776
1	500	G.E.	MT-412	2200	439
1	300	Whae.	CW	550	350
1	350	Cr. Wh.	Blas T18B	240/416	1705
1	350	G.E.	IM-17A	220/440	739
1	250	Whae.	CW-10-39C-15	440	720
1	250	G.E.	IM-18	220/440	875
1	250	G.E.	MT563Y	220/440	875
1	250	A.C.	Any	850	600
1	250	Whae.	CW	3200	450
1	250	Cr. Wh.	Blas 29Q	2300	350
1	250	G.E.	MT-434T	4000	307
1	200	G.E.	IE-13B	220	1800
1	200	Whae.	CW-890	2200	1775
1	200	Whae.	CW-874D	220/440	885
1	200	Cr. Wh.	RR-264B	440	305
1	200	G.E.	IM-17A	220/440	430
1	100	A.C.		410	690

Qu.	H.P.	Make	Type	Volts	Speed
1	800	G.E.	KT-873	2200	1180
1	500	G.E.	FT-550AY	2200	3600
1	500	Whae.	CB-1210	2200	863/445
1	400	Whae.	CB-1210	2200	500
1	300	Whae.	CB-1151	6000/4000	2555
1	300	Whae.	CB-1002	2200/440	690
1	300	Whae.	CB-8338	D.P.	220/440
1	150	G.E.	IE-15	2200	1750
1	150	G.E.	FT-550	2200	875
1	150	Whae.	CB	440	580
1	135	Whae.	CB-7640	220/440	1160
1	100	Whae.	CB-1660	2200/440	1100

## SYNCHRONOUS

Qu.	H.P.	Make	Type	Volts	Speed
1	6000	G.E.	ATI 8	2200/6000	600
1	3500	G.E.	TS 1.0	P.F. 4000/2300/4000	360
1	2500	Whae.	.8P.F.	2300	720
1	2000	G.E.	ATI	2300	900
1	1750	G.E.	ATI	2300	8600
1	1750	G.E.	TS	2200/4000	880
1	1325	G.E.	ATI	2200/1200	900
1	700	G.E.	TS .8P.F.	2200	1200
1	200	G.E.	IM	440/2200	580
1	350	Whae.	1.0P.F.	440	400
1	350	G.E.	ATI 1.0P.F.	2200	150
1	325	G.E.	ATI 1.0P.F.	440	1800
1	225	G.E.	ATI 1.0P.F.	440	1800

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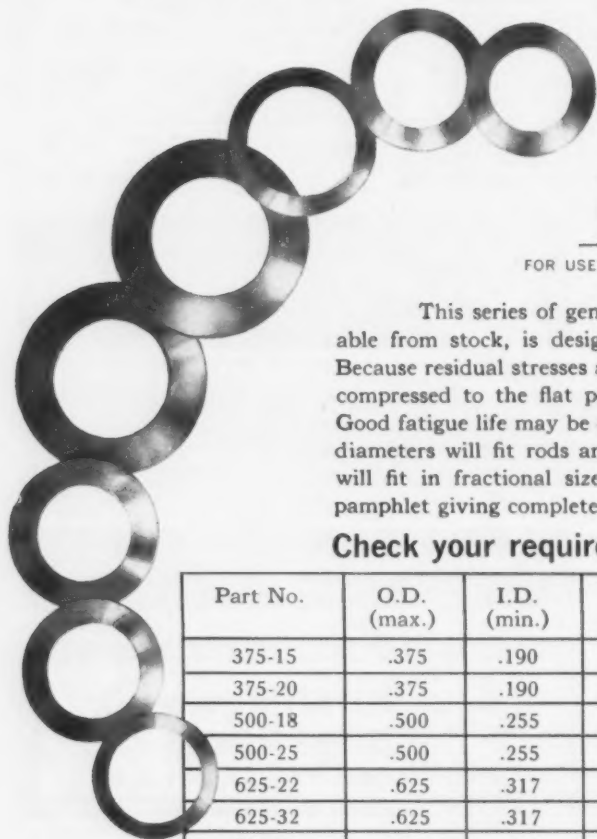


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Part No.	O.D. (max.)	I.D. (min.)	t	H (approx.)	$H_1$	$P_1$ $\pm 10\%$	$P^*$
375-15	.375	.190	.015	.027	.021	35	55
375-20	.375	.190	.020	.030	.025	60	110
500-18	.500	.255	.018	.034	.026	45	70
500-25	.500	.255	.025	.038	.031	95	160
625-22	.625	.317	.022	.042	.032	70	105
625-32	.625	.317	.032	.048	.040	145	260
750-28	.750	.380	.028	.051	.039	110	175
750-40	.750	.380	.040	.059	.049	235	415
1000-35	1.000	.505	.035	.067	.051	175	260
1000-50	1.000	.505	.050	.075	.062	340	600
1250-40	1.250	.630	.040	.082	.061	230	330
1250-62	1.250	.630	.062	.092	.077	475	870
1500-45	1.500	.755	.045	.093	.069	284	400
1500-72	1.500	.755	.072	.107	.089	665	1180



\*P Calculated Load at Flat Position



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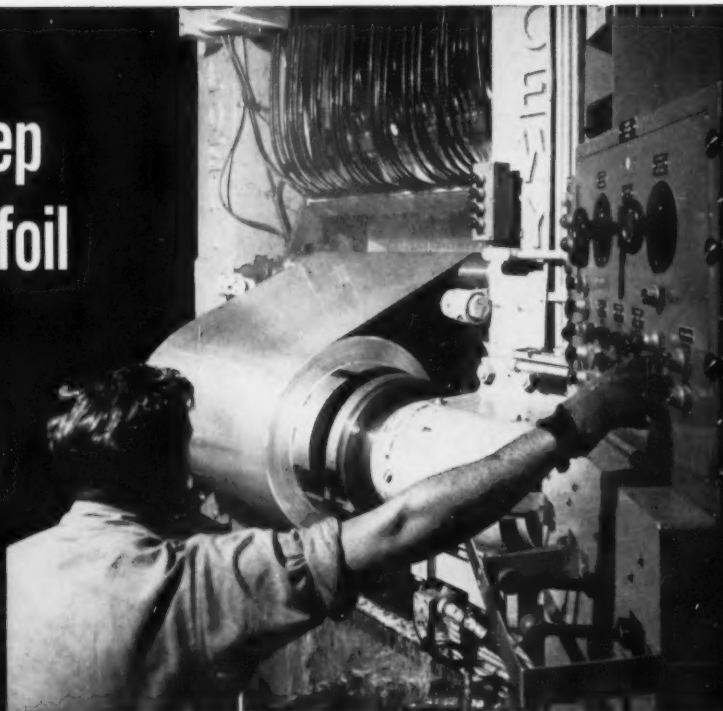
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# how to keep aluminum foil from shattering

... at 35 miles  
per hour!



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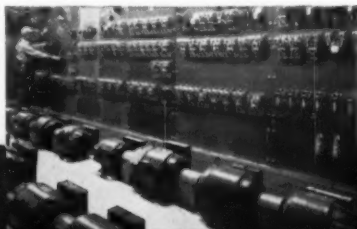
At 35 miles per hour, excessive strain at any of the several reduction stages would shatter the extremely thin foil. From the original payoff reel through to the final rewind, uniform tension is provided by Reliance V\*S Drives.

Reliance engineers designed this drive specifically for this mill, to provide the constant uniform tension which is so important.

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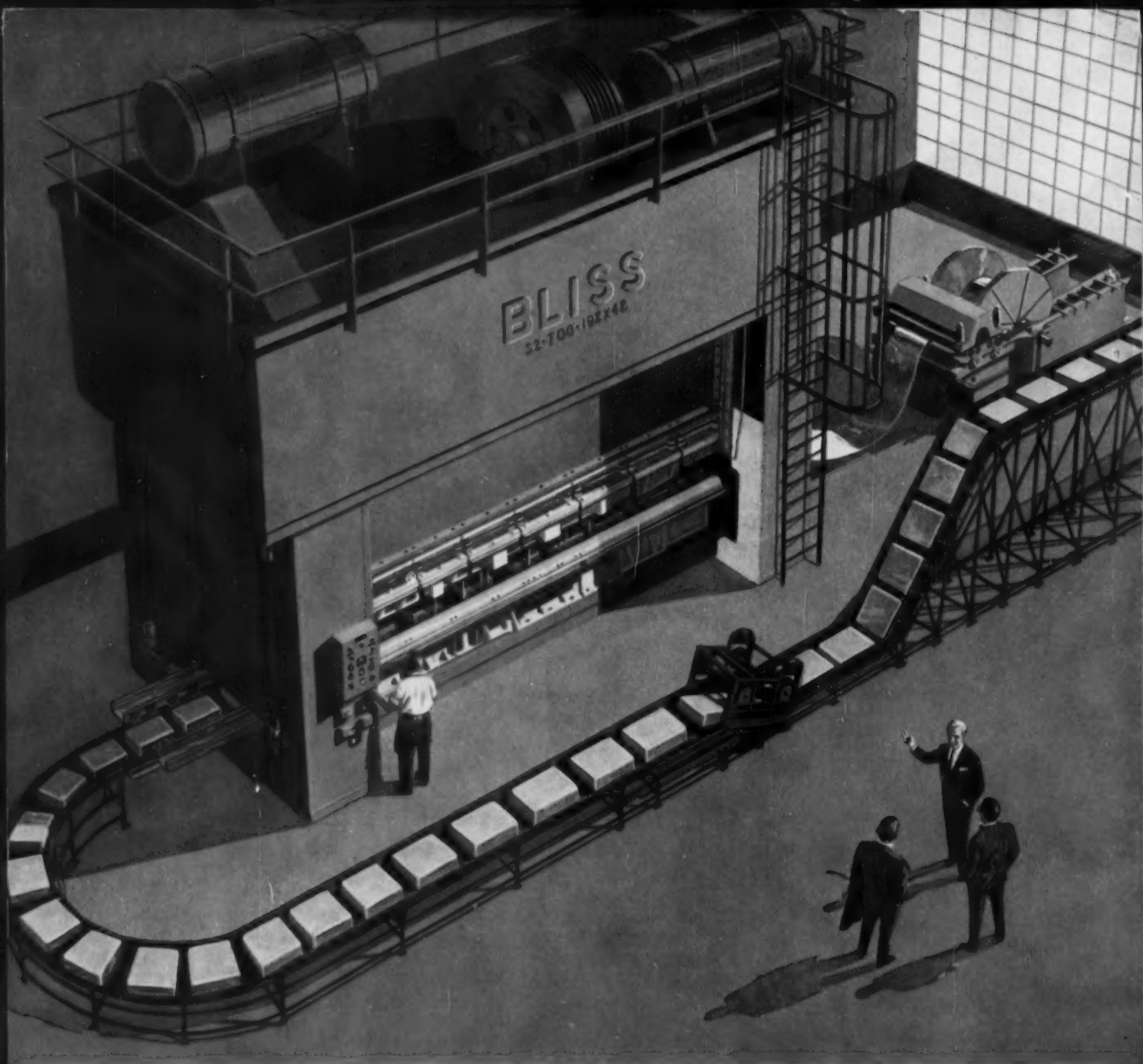


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